

Final

Volume 5: External Areas

Battelle Columbus Laboratories Decommissioning Project

Baseline, Revision 3

June 28, 2002

Volume 5—External Areas

- A. Outline of Volume
- B. Approach
- C. Cost by Year (separate volume)
- D. Schedule
- E. Logic Networks
- F. Pricing Sheets (separate volume)
& Data Templates

BCLDP Baseline: Activity ID / Work Package Matrix

Open Plan ID	Work Package Number	Description
External Areas		
I005	7I2-B01	Survey and Release North Well House
I005P	7I2-B01	PLAN: Survey and Release North Well House
I014	7I2-B02	Survey and Monitor JN-6 Guardhouse & Emergency Generator
I014P	7I2-B02	PLAN: Survey and Monitor JN-6 Guardhouse & Emergency Generator
I056	7I2-B03	Survey and Monitor JN-1 Back Apron
I056P	7I2-B03	PLAN: Survey and Monitor JN-1 Back Apron
I062	7I2-B04	Survey and Monitor JN-1 Back Controlled Area
I068	7I2-B05	Survey and Monitor JN-1 Front of Building
I074	7I2-B06	Survey and Monitor JN-1 Diesel Fuel Storage Tank
I074P	7I2-B06	PLAN: Survey and Monitor JN-1 Diesel Fuel Storage Tank
I080	7I2-B07	Survey and Monitor JN-1 Dilution Sump
I080P	7I2-B07	PLAN: Survey and Monitor JN-1 Dilution Sump
I086	7I2-B08	Survey and Monitor JN-1 Lake Outfall Line
I098	7I2-B09	Survey and Monitor JN-2 Underground Tank and Sump
I121	7I2-B12	Survey and Monitor JN-3 Dilution Sump
I121P	7I2-B12	PLAN: Survey and Monitor JN-3 Dilution Sump
I135	7I2-B13	Survey and Monitor Storm Lines
I135P	7I2-B13	PLAN: Survey and Monitor Storm Lines
I195	7I2-B13	Survey and Monitor Sanitary Sewer Lines
I195P	7I2-B13	PLAN: Survey and Monitor Sanitary Sewer Lines
I142	7I2-B14	Survey and Monitor Road
I149	7I2-B14	Perform Walkover Survey and Hot Spot Sampling of 11.47 Acres Inside Fence
I149P	7I2-B14	PLAN: Perform Walkover Survey and Hot Spot Sampling of 11.47 Acres Inside Fence
I154	7I2-B16	Survey and Monitor JN-1 Lake Outfall
I161	7I2-B17	Survey and Monitor JN-1 Front Apron
I192	7I2-B20	Survey and Monitor the Abandoned North Filter Bed area after WIDE Demobilization
I192P	7I2-B20	PLAN: Survey and Monitor the Abandoned North Filter Bed area after WIDE Demobilization
I001	7I4-B01	Remove JN-3 Diesel Tank
I001P	7I4-B01	PLAN: Remove JN-3 Diesel Tank
I002	7I4-B01	Remove JN-1 Emergency Generator
I002P	7I4-B01	PLAN: Remove JN-1 Emergency Generator
I003	7I4-B01	Remove JNT-2 Break Trailer by JN-1
I003P	7I4-B01	PLAN: Remove JNT-2 Break Trailer by JN-1
I009	7I4-B01	Remove JN-2 Electric Substation
I009P	7I4-B01	PLAN: Remove JN-2 Electric Substation
I010	7I4-B01	Remove JN-2 Emergency Generator
I010P	7I4-B01	PLAN: Remove JN-2 Emergency Generator
I018	7I4-B01	Remove New Access Control Point Trailer
I018P	7I4-B01	PLAN: Remove New Access Control Point Trailer
I019	7I4-B01	Remove Sea/Lands
I019P	7I4-B01	PLAN: Remove Sea/Lands
I020	7I4-B01	Remove Temporary Transformer
I020P	7I4-B01	PLAN: Remove Temporary Transformer
I021	7I4-B01	Remove Breathing Air System behind JN-1
I021P	7I4-B01	PLAN: Remove Breathing Air System behind JN-1
I023	7I4-B01	Remove JN-1 Boneyard
I023P	7I4-B01	PLAN: Remove JN-1 Boneyard
I025	7I4-B02	Remove JN-1 Sheep Shed
I025P	7I4-B02	PLAN: Remove JN-1 Sheep Shed
I026	7I4-B02	Remove Storage Trailer by Break Trailer
I026P	7I4-B02	PLAN: Remove Storage Trailer by Break Trailer
I035	7I4-B02	Remove Dosimetry Trailer
I035P	7I4-B02	PLAN: Remove Dosimetry Trailer

BCLDP Baseline: Activity ID / Work Package Matrix

Open Plan ID	Work Package Number	Description
I016	714-B04	Decontaminate JN-6 Guardhouse & Emergency Generator
I016P	714-B04	PLAN: Decontaminate JN-6 Guardhouse & Emergency Generator
I017	714-B05	Perform JN-6 Guardhouse & Emergency Generator Decon Completion Survey
I027	714-B06	Survey and Release Old Guardhouse
I027P	714-B06	PLAN: Survey and Release Old Guardhouse
I190	714-B07	Deployment of Wide System
I190P	714-B07	PLAN: Deployment of Wide System
I191	714-B07	Demobilize the WIDE System
I191P	714-B07	PLAN: Demobilize the WIDE System
I043	714-B08	Remediate Abandoned North Filter Beds
I043P	714-B08	PLAN: Remediate Abandoned North Filter Beds
I044	714-B09	Perform Abandoned North Filter Beds Completion Survey
I044P	714-B09	PLAN: Perform Abandoned North Filter Beds Completion Survey
I046	714-B10	Remediate Old Middle Filter Bed
I046P	714-B10	PLAN: Remediate Old Middle Filter Bed
I047	714-B11	Perform Old Middle Filter Bed Completion Survey
I049	714-B15	Remediate Active Middle Treatment System
I049P	714-B15	PLAN: Remediate Active Middle Treatment System
I050	714-B16	Perform Active Middle Treatment System Bed Completion Survey
I052	714-B17	Remediate Active North Filter Bed Area
I052P	714-B17	PLAN: Remediate Active North Filter Bed Area
I053	714-B18	Perform Active North Filter Bed Completion Survey
I054	714-B19	Locate JN-1 Back Apron Utilities
I058	714-B20	Remediate JN-1 Back Apron
I058P	714-B20	PLAN: Remediate JN-1 Back Apron
I059	714-B21	Perform JN-1 Back Apron Completion Survey
I064	714-B22	Remediate JN-1 Back Controlled Area
I064P	714-B22	PLAN: Remediate JN-1 Back Controlled Area
I065	714-B23	Perform JN-1 Back Controlled Area Completion Survey
I066	714-B24	Locate JN-1 Front of Building Utilities
I070	714-B25	Remediate JN-1 Front of Building
I070P	714-B25	PLAN: Remediate JN-1 Front of Building
I071	714-B26	Perform JN-1 Front Area Completion Survey
I076	714-B27	Remediate JN-1 Diesel Fuel Storage Tank
I076P	714-B27	PLAN: Remediate JN-1 Diesel Fuel Storage Tank
I077	714-B28	Perform JN-1 Diesel Fuel Storage Tank Completion Survey
I082	714-B29	Remediate JN-1 Dilution Sump
I082P	714-B29	PLAN: Remediate JN-1 Dilution Sump
I083	714-B30	Perform JN-1 Dilution Sump Completion Survey
I088	714-B31	Remediate JN-1 Lake Outfall Line
I088P	714-B31	PLAN: Remediate JN-1 Lake Outfall Line
I089	714-B32	Perform JN-1 Lake Outfall Line Completion Survey
I100	714-B34	Remediate JN-2 Underground Tank and Sump
I100P	714-B34	PLAN: Remediate JN-2 Underground Tank and Sump
I101	714-B35	Perform JN-2 Underground Tank and Sump Completion Survey
I118	714-B42	Perform JN-3 Reactor Coolant Pump Tank Completion Survey
I124	714-B43	Remediate JN-3 Dilution Sump
I124P	714-B43	PLAN: Remediate JN-3 Dilution Sump
I125	714-B44	Perform JN-3 Dilution Sump Completion Survey
I133	714-B45	Locate Storm Line Utilities
I138	714-B46	Remediate Storm Lines
I138P	714-B46	PLAN: Remediate Storm Lines
I193	714-B46	Stabilize and Leave in Place Sanitary Drain Under Dam
I193P	714-B46	PLAN: Stabilize and Leave in Place Sanitary Drain Under Dam

BCLDP Baseline: Activity ID / Work Package Matrix

Open Plan ID	Work Package Number	Description
I196	714-B46	Remediate Sanitary Sewer Lines
I196P	714-B46	PLAN: Remediate Sanitary Sewer Lines
I139	714-B47	Perform Storm Lines Completion Survey
I197	714-B47	Perform Sanitary Sewer Lines Completion Survey
I143	714-B48	Relocate WJ North Utilities
I143P	714-B48	PLAN: Relocate WJ North Utilities
I145	714-B48	Remediate Road
I145P	714-B48	PLAN: Remediate Road
I146	714-B49	Perform Road Completion Survey
I151	714-B50	Remediate Remaining 11.47 Acres Inside Fence
I151P	714-B50	PLAN: Remediate Remaining 11.47 Acres Inside Fence
I152	714-B51	Perform Remaining 11.47 Acres Inside Fence Completion Survey
I156	714-B52	Remediate JN-1 Lake Outfall
I156P	714-B52	PLAN: Remediate JN-1 Lake Outfall
I157	714-B53	Perform JN-1 Lake Outfall Completion Survey
I163	714-B54	Remediate JN-1 Front Apron
I163P	714-B54	PLAN: Remediate JN-1 Front Apron
I164	714-B55	Perform JN-1 Front Apron Completion Survey
I165	714-B56	Plan and Remediate JN-10/11 Grounds (columns/sanitary tank)
I165P	714-B56	PLAN: Plan and Remediate JN-10/11 Grounds (columns/sanitary tank)
I176	714-B57	Build JN-4 Access Road
I176P	714-B57	PLAN: Build JN-4 Access Road
I179	714-B58	Remove Rad Lab Trailer
I179P	714-B58	PLAN: Remove Rad Lab Trailer
I184	714-B59	Remove Air Stations
I185	714-B59	Remove Wells
I185P	714-B59	PLAN: Remove Wells
I181	714-B60	Obtain and Install New Access Control Point
I181P	714-B60	PLAN: Obtain and Install New Access Control Point
I180	714-B61	Establish New Radioanalytical Laboratory (RAL)
I180A	714-B61	RAD Lab Trailer Leasing Costs
I180P	714-B61	PLAN: Establish New Radioanalytical Laboratory (RAL)
I182	714-B62	Backfill External Areas Inside Fence
I182P	714-B62	PLAN: Backfill External Areas Inside Fence
I183	714-B63	Remove Remaining West Jeff End-State Items
I183P	714-B63	PLAN: Remove Remaining West Jeff End-State Items
I198	714-B64	Develop JN-4 Isolation Plan
I198P	714-B64	PLAN: Develop JN-4 Isolation Plan
IG002	714-B65	Monitoring of wells and data analysis
IG007	714-B65	Dewatering of JN-3
IG011	714-B65	JN-1 dewatering
IG003	714-B66	Install water discharge/containment system for pumped water
IG004	714-B66	Install 10 pits into 885 layer
IG005	714-B66	Install 3 basal sand wells and 2 additional JN-3 dewatering wells
IG006	714-B66	Perform JN-3 pilot dewatering tests and drill Geoprobe borings
IG008	714-B66	Install 2 855 downgradient wells.5 downgradient 885 wells.JN1 3-well cluster
IG009	714-B66	Install JN-1 6 885 and 4 855 dewatering wells
IG010	714-B66	Perform JN-1 pilot dewatering tests and Geoprobe borings
IG012	714-B66	Disposition and abandonment of wells and discharge/containment system
I200	714-B67	Install Locker room/Break room/Rest room Trailer and lease
I200P	714-B67	PLAN: Install Locker room/Break room/Rest room Trailer and lease
IS004	715-B02	Prepare Filter Beds Area Characterization and Final Status Report
IS005	715-B02	Conduct Filter Beds Area IVC
IS005P	715-B02	PLAN: Conduct Filter Beds Area IVC

BCLDP Baseline: Activity ID / Work Package Matrix

Open Plan ID	Work Package Number	Description
IS019	715-B04	Prepare General Inside Fence/Unaffected Areas Characterization/Final Status Report
IS020	715-B04	Conduct General Inside Fence/Unaffected Areas IVC
IS020P	715-B04	PLAN: Conduct General Inside Fence/Unaffected Areas IVC
IS021	715-B05	Prepare and Submit Certification Docket for West Jeff North Site

BCLDP Baseline, Revision 3

Approach

Discussion of Underground Drain Lines and Other Subterranean Services

There are various underground potable water, fire protection water, sanitary water, gas, and fuel lines, including electrical services traversing the site. In addition, there is a Shell Oil Company gasoline transmission line that crosses the site. Certain drain lines are considered suspect-contaminated due to past operations conducted in JN-1, JN-2, JN-3, and JN-4. Soil sampling, removal of contaminated lines, and excavating in general must be performed cautiously in order to avoid damage to the various underground systems. Refer to attached maps for illustrations of the various services that are located underground. Complete documentation of all underground services is located in the BCLDP Characterization files.

Discussion of Filter Beds

The filter bed area is located between the north site and Darby Creek to the east. The area also contains the sewage treatment system for the middle site that operates independently from the north site beds. There have been a total of three filter beds used to process sewage water generated from the north site. There are two abandoned beds in addition to a third bed that is currently in use. The first abandoned bed was in use from approximately 1955 when the first building, JN-1, was constructed until 1958. The second bed began operation in 1958, and was operated until 1979. The third bed has been in use since 1979. Any radioactive material contamination identified in the beds and associated septic/treatment tanks is related to North Site Nuclear Area operations. The middle site released sanitary water to north site beds at one time prior to the construction of the dedicated treatment systems for the middle area. Any radioactive-tracer materials used at the middle site are not considered to be contributors to the contamination inventory of any of the beds associated with the BCLDP remediation. Refer to the attached maps for an illustration of the filter bed area. Complete documentation of the filter bed area is located in the BCLDP Characterization files.

Discussion of Areas Considered Free of Contamination

There are soil areas on site that have been characterized and are considered to be free of contamination. Characterization is an on-going process. Documentation is available for review in the BCLDP Characterization files.

Discussion of Known Contaminated Areas

Staff knowledge supported by historical records, routine and non-routine radiological surveillance, and soil characterization surveys support the existence of contamination in various external locations. Those locations are identified below. Documentation is available for review in the BCLDP Characterization files.

- External areas adjacent to Building JN-1:
 - Lawn area immediately in front of the building, including portions of the paved area between JN-1 and JN-2.
 - Paved area behind JN-1 including soil immediately adjacent on all sides due to runoff of contamination over the years.
 - Underground drainage pipes exiting the building.
 - Underground wastewater tank at southeast corner of the building.
- External areas adjacent to Building JN-2:
 - There are no known contaminated ground areas immediately external to JN-2 except as described to the front (west) of JN-1 or external to JN-3 and JN-4.
- External areas adjacent to Building JN-3:
 - Sump in front of and on the east side of the building, including underground drain lines proceeding in a southeast direction to the filter bed area.
- External areas adjacent to Building JN-4:
 - Any drain lines from the former plutonium lab operations that proceed southeast to the filter bed area.
- Filter beds east of buildings:
 - Refer to attached maps for illustrations of the beds, associated drain lines, and septic tanks.

Discussion of Areas Suspected of Contamination

There are soil areas on site that have not been fully characterized and are suspected to be contamination. Those locations are identified below. Characterization is an on-going process, and existing documentation is available for review in the BCLDP Characterization files.

- External areas adjacent to Building JN-1:
 - Lawn immediately in front of the building, including portions of the paved areas between JN-1 and JN-2.
 - Pavement contamination from washing off parked trucks that delivered irradiated fuel shipments to JN-1.
 - Paved area behind JN-1 including, soil immediately adjacent on all sides due to runoff of contamination over the years.
 - All underground drainage pipes exiting the building.
 - Underground wastewater tank at northeast corner of the building.
 - Sub-floor contamination is also suspect under the JN-1A section of the building, including under the machine shop northeast corner.
 - Underground soil contamination is known/suspected to the east of (behind) the building.
- External areas adjacent to Building JN-2:
 - The underground waste tank area north of the building adjacent to the Radioanalytical Laboratory.
 - In the past there have been small spills of slightly contaminated water in the proximity of the RAL underground tank during tank emptying operations. Concentrations of radioactivity in the spilled water did not require soil remediation.
- External areas adjacent to Building JN-3:
 - None, other than the areas described under known areas for this building.
- External areas adjacent to Building JN-4:
 - The external drain lines and areas where underground storage tanks associated with the former plutonium lab were located.

Planned Approach for D&D of External Areas (Exclusive of Abandoned North Filter Bed Area)

The external areas associated with the BCLDP include all areas within the West Jefferson North site fence, the abandoned and active filter bed areas below the Battelle Lake dam, storm sewer out-falls to the lake, and the JN-10 modular office complex. Extensive

characterization of the soils and facilities in and surrounding these areas has begun and will continue. In-situ surveys have been conducted in all accessible underground drain lines, and soil sampling to depths of five meters is in progress according to a biased statistical grid pattern throughout the site. Direct-reading surveys have been conducted where possible but cannot be completed until area background levels are returned to normal by removal of the TRU waste from the site.

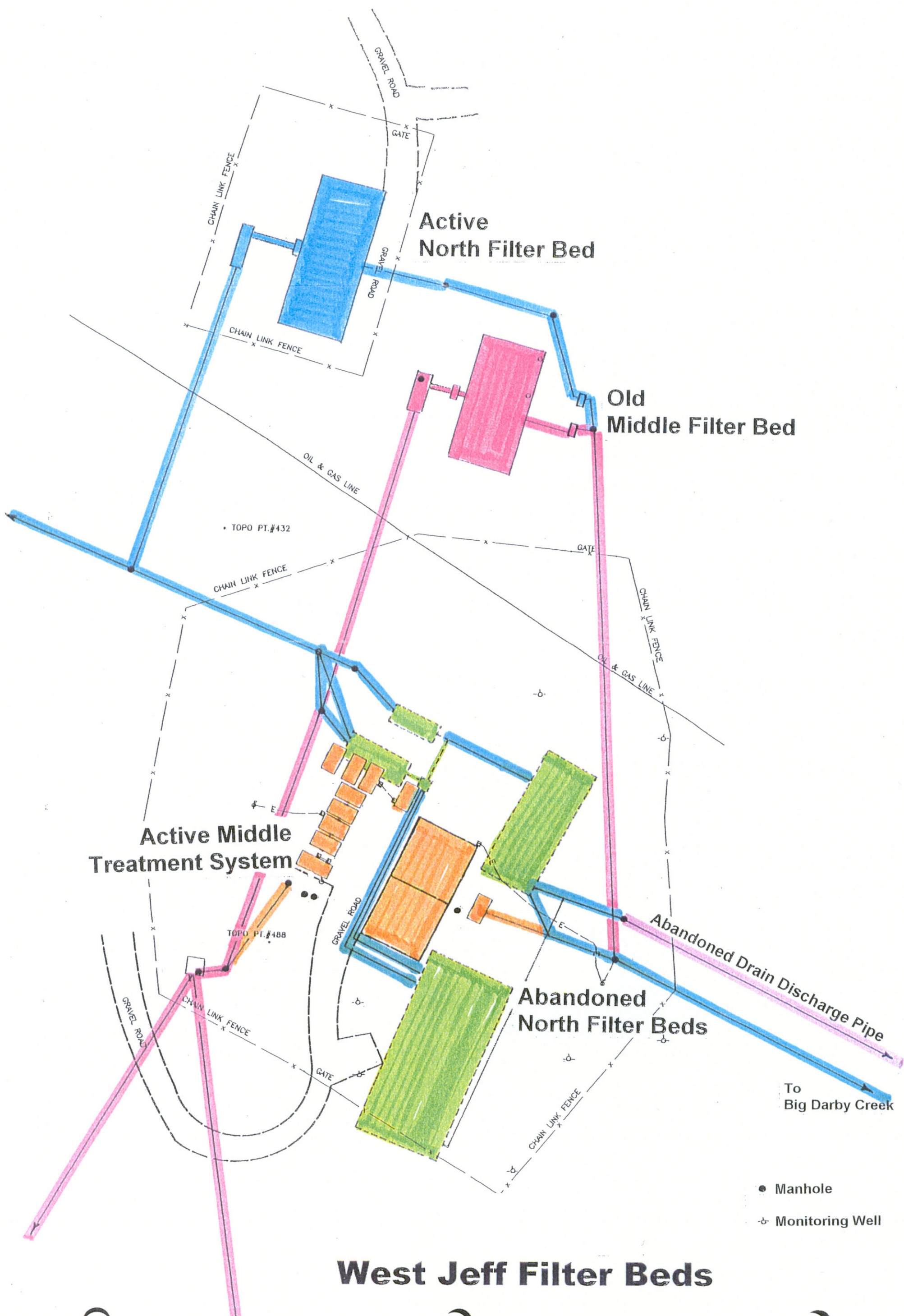
The currently assumed end-state for the BCLDP is complete removal of JN-1, JN-2, JN-3, and their foundations/footings, and supplied utilities. Building JN-4, which is not a part of the project, will remain and its utilities must be separated/relocated from those associated with the other three buildings. Planning and separation of utilities, water, gas, electric, and drains, and both pedestrian and vehicular access to JN-4 will be performed during the first years covered by this baseline.

Underground drain lines found to be contaminated by in-situ monitoring and those that could not be accessed for characterization/monitoring will be excavated and removed in conjunction with the removal of contaminated soil from beneath the associated buildings, as well as adjacent paved areas, buried sumps, fuel storage tanks, and supply lines. All other contaminated soil areas, paved or not, will be removed according to a schedule that will not interfere with demolition and removal of the major buildings and facilities. The last facility to be removed will be the JN-10 office complex and its associated utility feeds, wastewater holding tank, and paved parking area.

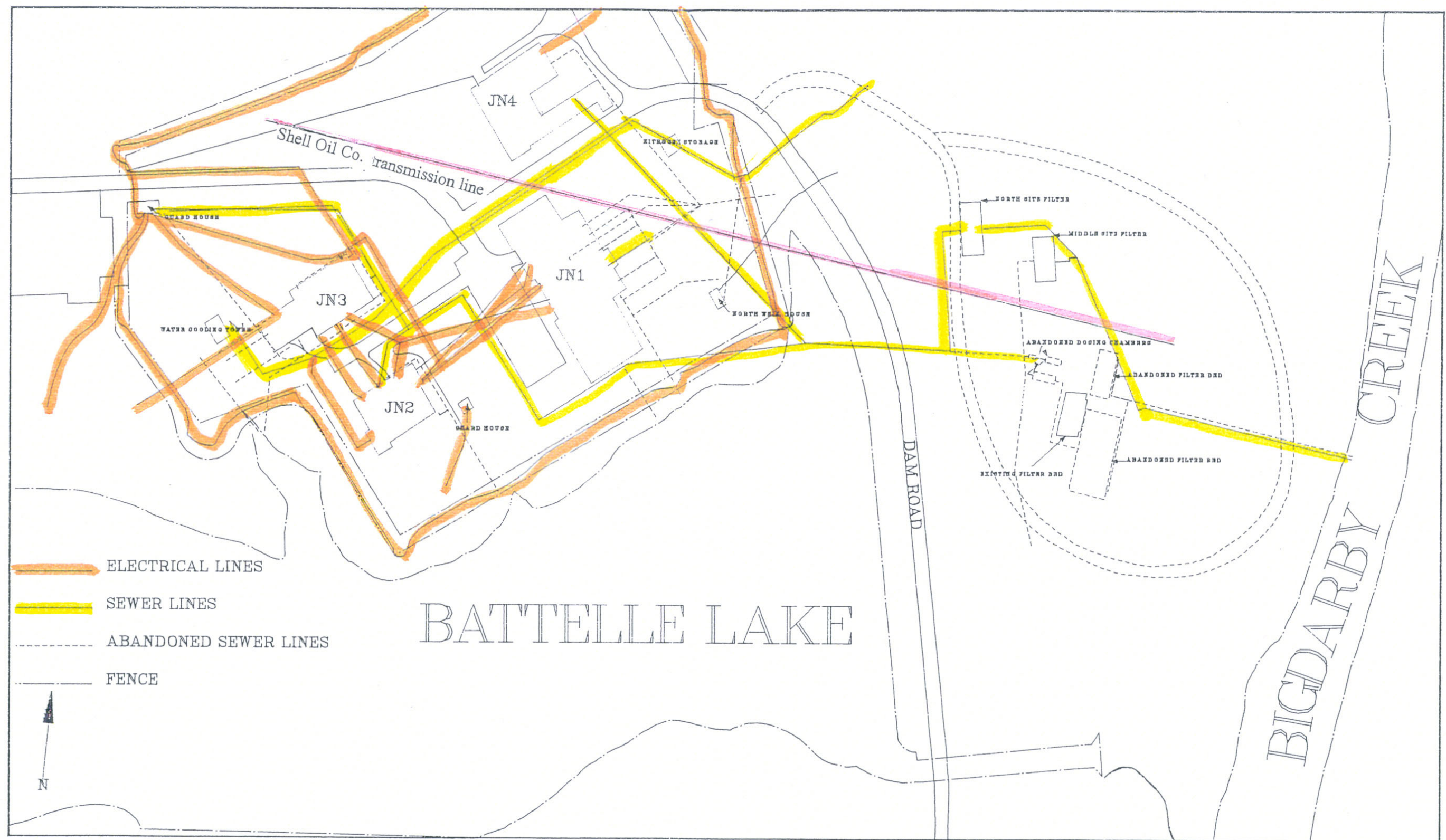
Planned Approach for D&D of Abandoned North Filter Bed Area

The WIDE system is currently being tested at the Abandoned North Filter Bed for its effectiveness in removing contaminants, particularly cesium, from the soil. The system inserts water containing a lixiviate into the ground, and then collects the water and lixiviate after it has had an opportunity to extract the cesium from the soil. This is an experimental technology that, if effective, will save cost relative to the proven technology of soil excavation and disposal. Once the WIDE has been operated for a sufficient time (approximately 6 months to 1 year) to determine its effectiveness, characterization of the area will occur. At that point, a determination will be made on the final remediation approach that will be implemented.








West Jeff Filter Beds



OPEN PLAN - PDM
 Report: ZBAR
 Project: BASELINE
 Timenow: 01OCT02
 Date: 27JUN02
 Page: 1

Battelle

BCLDP BASELINE: EXTERNAL AREAS

BAR LEGEND
 Actuals
 Forecast
 Baseline

WORKPKG	BCST	PCT	DU	ROU	BSTART	BFINISH	ESDATE	EFDATE	01 OCT 02	01 OCT 03	01 OCT 04	01 OCT 05	01 OCT 06	01 OCT 07
1.7.I.2. WJ EXTERNAL AREAS CHARACTERIZATION									Time now					
712-B01 : SURVEY AND RELEASE NORTH WELL HOUSE														
I005P PLAN: Survey and Release North Well House														
712-B01	\$ 5552	5	5		01OCT02	07OCT02	01OCT02	07OCT02						
I005 Survey and Release North Well House														
712-B01	\$ 13364	10	10		08OCT02	21OCT02	08OCT02	21OCT02						
712-B02 : SURVEY AND MONITOR JN-6 GUARDHOUSE/EMERGENCY GENERATOR														
I014P PLAN: Survey and Monitor JN-6 Guardhouse & Emergency Generator														
712-B02	\$ 8061	5	5		15AUG06	21AUG06	15AUG06	21AUG06				I014P		
I014 Survey and Monitor JN-6 Guardhouse & Emergency Generator												I014		
712-B02	\$ 11245	4	4		08SEP06	13SEP06	08SEP06	13SEP06						
712-B03 : SURVEY AND MONITOR JN-1 BACK APRON														
I056P PLAN: Survey and Monitor JN-1 Back Apron														
712-B03	\$ 15211	5	5		01MAY06	05MAY06	01MAY06	05MAY06				I056P		
I056 Survey and Monitor JN-1 Back Apron												I056		
712-B03	\$ 68199	24	24		23MAY06	26JUN06	23MAY06	26JUN06						
712-B04 : SURVEY AND MONITOR JN-1 BACK CTRL AREA														
I062 PLAN: Survey and Monitor JN-1 Back Controlled Area														
712-B04	\$ 93118	33	33		31MAY06	18JUL06	31MAY06	18JUL06				I062		
712-B05 : SURVEY AND MONITOR JN-1 FRONT OF BUILDING														
I068 PLAN: Survey and Monitor JN-1 Front of Building														
712-B05	\$ 19656	7	7		31MAY06	08JUN06	31MAY06	08JUN06				I068		
712-B06 : SURVEY AND MONITOR JN-1 DIESEL FUEL STORAGE TANK														
I074P PLAN: Survey and Monitor JN-1 Diesel Fuel Storage Tank														
712-B06	\$ 8061	5	5		16MAY05	20MAY05	16MAY05	20MAY05			I074P			

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BCLDP BASELINE: EXTERNAL AREAS

 Actuals
 Forecast
 Baseline

WORKPKG	BCOST	PCT	DU	RDU	BSTART	BFINISH	ESDATE	EFDATE	01 OCT 02	01 OCT 03	01 OCT 04	01 OCT 05	01 OCT 06	01 OCT 07
I074 Survey and Monitor JN-1 Diesel Fuel Storage Tank									Timenow		I074			
712-B06	\$ 5544		2	2	07JUN05	08JUN05	07JUN05	08JUN05						
712-B07 : JN-1 DILUTION SUMP BACKGROUND/SURVEY														
I080P PLAN: Survey and Monitor JN-1 Dilution Sump									I080P					
712-B07	\$ 8061		5	5	02JUN03	06JUN03	02JUN03	06JUN03						
I080 Survey and Monitor JN-1 Dilution Sump									I080					
712-B07	\$ 6197		2	2	23JUL03	24JUL03	23JUL03	24JUL03						
712-B08 : SURVEY AND MONITOR JN-1 LAKE OUTFALL LINE												I086		
I086 Survey and Monitor JN-1 Lake Outfall Line														
712-B08	\$ 59154		21	21	31MAY06	28JUN06	31MAY06	28JUN06						
712-B09 : SURVEY AND MONITOR JN-2 UNDERGRD TANK/SUMP														
I098 Survey and Monitor JN-2 Underground Tank and Sump									I098					
712-B09	\$ 8820		3	3	23JUL04	27JUL04	23JUL04	27JUL04						
712-B12 : SURVEY AND MONITOR JN-3 DILUTION SUMP														
I121P PLAN: Survey and Monitor JN-3 Dilution Sump									I121P					
712-B12	\$ 8061		5	5	01JUN04	07JUN04	01JUN04	07JUN04						
I121 Survey and Monitor JN-3 Dilution Sump									I121					
712-B12	\$ 6116		2	2	21JUN04	22JUN04	21JUN04	22JUN04						
712-B13 : SURVEY AND MONITOR STORM/SANITARY SEWER LINES														
I135P PLAN: Survey and Monitor Storm Lines									I135P					
712-B13	\$ 22363		10	10	01OCT02	14OCT02	01OCT02	14OCT02						
I135 Survey and Monitor Storm Lines									I135					
712-B13	\$ 361296		135	135	15OCT02	28APR03	15OCT02	28APR03						
I195P PLAN: Survey and Monitor Sanitary Sewer Lines									I195P					
712-B13	\$ 22363		10	10	05JAN04	16JAN04	05JAN04	16JAN04						
I195 Survey and Monitor Sanitary Sewer Lines									I195					
712-B13	\$ 267622		100	100	04FEB04	23JUN04	04FEB04	23JUN04						
712-B14 : WALKOVER SURVEY/HOT SPOT SAMPLE 11.47 ACRES INSIDE F														

Battelle
BCLDP BASELINE: EXTERNAL AREAS

 Actuals
 Forecast
 Baseline

WORKPKG	BCOST	PCT	DU	ROU	BSTART	BFINISH	ESDATE	EFDATE	O1 OCT 02	O1 OCT 03	O1 OCT 04	O1 OCT 05	O1 OCT 06	O1 OCT 07
I149P PLAN: Perform Walkover Survey and Hot Spot Sampling of 11.47 Acres 1														
712-B14	\$ 22272		10	10	01OCT03	14OCT03	01OCT03	14OCT03						
I149 Perform Walkover Survey and Hot Spot Sampling of 11.47 Acres Insid 1														
712-B14	\$ 131166		35	35	15OCT03	04DEC03	15OCT03	04DEC03						
I142 Survey and Monitor Road 1														
712-B14	\$ 64816		23	23	31MAY06	30JUN06	31MAY06	30JUN06						
712-B16 : SURVEY AND MONITOR JN-1 LAKE OUTFALL														
I154 Survey and Monitor JN-1 Lake Outfall 1														
712-B16	\$ 17661		6	6	28SEP04	05OCT04	28SEP04	05OCT04						
712-B17 : SURVEY AND MONITOR JN-1 FRONT APRON														
I161 Survey and Monitor JN-1 Front Apron 1														
712-B17	\$ 39385		14	14	31MAY06	19JUN06	31MAY06	19JUN06						
712-B20 : SURVEY/MONITOR ABAND NORTH FILTER BED AREA AFTER WID														
I192P PLAN: Survey and Monitor the Abandoned North Filter Bed area after 1														
712-B20	\$ 15211		5	5	15JUN04	21JUN04	15JUN04	21JUN04						
I192 Survey and Monitor the Abandoned North Filter Bed area after WIDE 1														
712-B20	\$ 31229		11	11	21JUL04	04AUG04	21JUL04	04AUG04						
1.7.I.4. WJ EXTERNAL AREAS DECONTAMINATION OPERATIONS														
714-B01 : REMOVAL OF AFFECTED FACILITIES														
I023P PLAN: Remove JN-1 Boneyard 1														
714-B01	\$ 5552		5	5	01OCT02	07OCT02	01OCT02	07OCT02						
I023 Remove JN-1 Boneyard 1														
714-B01	\$ 62852		40	40	08OCT02	04DEC02	08OCT02	04DEC02						
I020P PLAN: Remove Temporary Transformer 1														
714-B01	\$ 5552		5	5	15APR03	21APR03	15APR03	21APR03						


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I021P PLAN: Remove Breathing Air System behind JN-1								1	Timenow					
714-B01 \$ 5552	5	5	15APR03	21APR03	15APR03	21APR03			I021P					
I020 Remove Temporary Transformer								1		I020				
714-B01 \$ 11973	5	5	05MAY03	09MAY03	05MAY03	09MAY03								
I021 Remove Breathing Air System behind JN-1								1		I021				
714-B01 \$ 10105	5	5	05MAY03	09MAY03	05MAY03	09MAY03								
I001P PLAN: Remove JN-3 Diesel Tank								1		I001P				
714-B01 \$ 4347	2	2	02AUG04	03AUG04	02AUG04	03AUG04								
I001 Remove JN-3 Diesel Tank								1		I001				
714-B01 \$ 5667	2	2	18OCT04	19OCT04	18OCT04	19OCT04								
I002P PLAN: Remove JN-1 Emergency Generator								1			I002P			
714-B01 \$ 5552	5	5	16MAY05	20MAY05	16MAY05	20MAY05								
I009P PLAN: Remove JN-2 Electric Substation								1			I009P			
714-B01 \$ 5552	5	5	16MAY05	20MAY05	16MAY05	20MAY05								
I010P PLAN: Remove JN-2 Emergency Generator								1			I010P			
714-B01 \$ 5552	5	5	16MAY05	20MAY05	16MAY05	20MAY05								
I002 Remove JN-1 Emergency Generator								1			I002			
714-B01 \$ 12522	5	5	07JUN05	13JUN05	07JUN05	13JUN05								
I009 Remove JN-2 Electric Substation								1			I009			
714-B01 \$ 27783	5	5	07JUN05	13JUN05	07JUN05	13JUN05								
I010 Remove JN-2 Emergency Generator								1			I010			
714-B01 \$ 9750	5	5	07JUN05	13JUN05	07JUN05	13JUN05								
I019P PLAN: Remove Sea/Lands								1				I019P		
714-B01 \$ 5552	5	5	01MAY06	05MAY06	01MAY06	05MAY06								
I019 Remove Sea/Lands								1				I019		
714-B01 \$ 85141	40	40	31MAY06	27JUL06	31MAY06	27JUL06								
I003P PLAN: Remove JN-2 Break Tractor by JN-1								1				I003P		
714-B01 \$ 5552	5	5	01AUG06	07AUG06	01AUG06	07AUG06								











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+ Timenow														
I018P PLAN: Remove New Access Control Point Trailer								1					I018P	
714-B01	\$ 5552		5	5	15AUG06	21AUG06	15AUG06	21AUG06						
I003 Remove JNT-2 Break Trailer by JN-1								1					I003	
714-B01	\$ 43220		30	30	17AUG06	28SEP06	17AUG06	28SEP06						
I018 Remove New Access Control Point Trailer								1					I018	
714-B01	\$ 17798		10	10	08SEP06	21SEP06	08SEP06	21SEP06						
714-B02 : DISPOSAL OF AFFECTED FACILITIES														
I025P PLAN: Remove JN-1 Sheep Shed								1						
714-B02	\$ 5552		5	5	01OCT02	07OCT02	01OCT02	07OCT02						
I025 Remove JN-1 Sheep Shed								1						
714-B02	\$ 15404		10	10	08OCT02	21OCT02	08OCT02	21OCT02						
I026P PLAN: Remove Storage Trailer by Break Trailer								1					I026P	
714-B02	\$ 5552		5	5	01AUG06	07AUG06	01AUG06	07AUG06						
I035P PLAN: Remove Dosimetry Trailer								1					I035P	
714-B02	\$ 5552		5	5	01AUG06	07AUG06	01AUG06	07AUG06						
I035 Remove Dosimetry Trailer								1					I035	
714-B02	\$ 35485		20	20	17AUG06	14SEP06	17AUG06	14SEP06						
I026 Remove Storage Trailer by Break Trailer								1					I026	
714-B02	\$ 43469		25	25	17AUG06	21SEP06	17AUG06	21SEP06						
714-B04 : DECON JN-6 GUARDHOUSE/EMERGENCY GENERATOR														
I016P PLAN: Decontaminate JN-6 Guardhouse & Emergency Generator								1					I016P	
714-B04	\$ 8842		20	20	01AUG06	28AUG06	01AUG06	28AUG06						
I016 Decontaminate JN-6 Guardhouse & Emergency Generator								1					I016	
714-B04	\$ 13975		4	4	14SEP06	19SEP06	14SEP06	19SEP06						
714-B05 : JN-6 GUARDHOUSE/EMER GENERATOR DECON COMPLETION SURV														
I017 Perform JN-6 Guardhouse & Emergency Generator Decon Completion Sur								1					I017	
714-B05	\$ 8125		3	3	20SEP06	22SEP06	20SEP06	22SEP06						
714-B06 : SURVEY AND RELEASE OLD GUARDHOUSE														

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I027P PLAN: Survey and Release Old Guardhouse									Timenow					
714-B06	\$ 5552		5	5	01OCT02	07OCT02	01OCT02	07OCT02						
I027 Survey and Release Old Guardhouse														
714-B06	\$ 13364		10	10	08OCT02	21OCT02	08OCT02	21OCT02						
714-B07 : PERFORM ABANDONED DRAIN DISCHG PIPE COMPLETE SURVEY														
I190P PLAN: Deployment of Wide System														
714-B07	\$ 12036		220	220	01OCT02	13AUG03	01OCT02	13AUG03						
I190 Deployment of Wide System														
714-B07	\$ 621972		220	220	14AUG03	28JUN04	14AUG03	28JUN04						
I191P PLAN: Demobilize the WIDE System														
714-B07	\$ 18865		20	20	29APR04	26MAY04	29APR04	26MAY04						
I191 Demobilize the WIDE System														
714-B07	\$ 82522		15	15	29JUN04	20JUL04	29JUN04	20JUL04						
714-B08 : REMEDIATE ABANDONED NORTH FILTER BEDS														
I043P PLAN: Remediate Abandoned North Filter Beds														
714-B08	\$ 17078		17	17	01JUL04	26JUL04	01JUL04	26JUL04						
I043 Remediate Abandoned North Filter Beds														
714-B08	\$ 650190		87	87	05AUG04	08DEC04	05AUG04	08DEC04						
714-B09 : PERFORM ABANDONED NORTH FILTER BEDS COMPLETION SURVEY														
I044P PLAN: Perform Abandoned North Filter Beds Completion Survey														
714-B09	\$ 15211		5	5	15DEC04	21DEC04	15DEC04	21DEC04						
I044 Perform Abandoned North Filter Beds Completion Survey														
714-B09	\$ 86134		34	34	14JAN05	02MAR05	14JAN05	02MAR05						
714-B10 : REMEDIATE OLD MIDDLE FILTER BED														
I046P PLAN: Remediate Old Middle Filter Bed														
714-B10	\$ 19696		20	20	01OCT03	28OCT03	01OCT03	28OCT03						

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1058P PLAN: Remediate JN-1 Back Apron									1					
714-B20	\$ 19061		20	20	01JUN06	28JUN06	01JUN06	28JUN06				I058P		
1058 Remediate JN-1 Back Apron									1					
714-B20	\$ 115160		34	34	14JUL06	30AUG06	14JUL06	30AUG06				I058		
714-B21 : PERFORM JN-1 BACK APRON COMPLETION SURVEY														
1059 Perform JN-1 Back Apron Completion Survey									1					
714-B21	\$ 14111		5	5	31AUG06	07SEP06	31AUG06	07SEP06				I059		
714-B22 : REMEDIATE JN-1 BACK CONTROLLED AREA														
1064P PLAN: Remediate JN-1 Back Controlled Area									1					
714-B22	\$ 19061		20	20	01JUN06	28JUN06	01JUN06	28JUN06				I064P		
1064 Remediate JN-1 Back Controlled Area									1					
714-B22	\$ 21692		6	6	19JUL06	26JUL06	19JUL06	26JUL06				I064		
714-B23 : PERFORM JN-1 BACK CONTROLLED AREA COMPLETION SURVEY														
1065 Perform JN-1 Back Controlled Area Completion Survey									1					
714-B23	\$ 14111		5	5	27JUL06	02AUG06	27JUL06	02AUG06				I065		
714-B24 : LOCATE JN-1 FRONT OF BUILDING UTILITIES														
1066 Locate JN-1 Front of Building Utilities									1					
714-B24	\$ 2401		15	15	09JUN06	29JUN06	09JUN06	29JUN06				I066		
714-B25 : REMEDIATE JN-1 FRONT OF BUILDING														
1070P PLAN: Remediate JN-1 Front of Building									1					
714-B25	\$ 19004		20	20	01MAY06	26MAY06	01MAY06	26MAY06				I070P		
1070 Remediate JN-1 Front of Building									1					
714-B25	\$ 52399		16	16	30JUN06	25JUL06	30JUN06	25JUL06				I070		
714-B26 : PERFORM JN-1 FRONT AREA COMPLETION SURVEY														
1071 Perform JN-1 Front Area Completion Survey									1					
714-B26	\$ 5659		2	2	26JUL06	27JUL06	26JUL06	27JUL06				I071		
714-B27 : REMEDIATE JN-1 DIESEL FUEL STORAGE TANK														











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I076P PLAN: Remediate JN-1 Diesel Fuel Storage Tank 1									Time now					
714-B27	\$ 8842	20	20		20APR05	17MAY05	20APR05	17MAY05			I076P 			
I076 Remediate JN-1 Diesel Fuel Storage Tank 1											I076 			
714-B27	\$ 28962	5	5		09JUN05	15JUN05	09JUN05	15JUN05						
714-B28 : PERFORM JN-1 DIESEL FUEL STORE TNK COMPLETE SURVEY														
I077 Perform JN-1 Diesel Fuel Storage Tank Completion Survey 1											I077 			
714-B28	\$ 2831	1	1		16JUN05	16JUN05	16JUN05	16JUN05						
714-B29 : REMEDIATE JN-1 DILUTION SUMP														
I082P PLAN: Remediate JN-1 Dilution Sump 1									I082P 					
714-B29	\$ 10782	20	20		01MAY03	29MAY03	01MAY03	29MAY03						
I082 Remediate JN-1 Dilution Sump 1									I082 					
714-B29	\$ 74819	24	24		25JUL03	27AUG03	25JUL03	27AUG03						
714-B30 : PERFORM JN-1 DILUTION SUMP COMPLETION SURVEY														
I083 Perform JN-1 Dilution Sump Completion Survey 1									I083 					
714-B30	\$ 3094	1	1		28AUG03	28AUG03	28AUG03	28AUG03						
714-B31 : REMEDIATE JN-1 LAKE OUTFALL LINE														
I088P PLAN: Remediate JN-1 Lake Outfall Line 1												I088P 		
714-B31	\$ 10035	10	10		30MAY06	12JUN06	30MAY06	12JUN06						
I088 Remediate JN-1 Lake Outfall Line 1												I088 		
714-B31	\$ 19577	6	6		29JUN06	10JUL06	29JUN06	10JUL06						
714-B32 : PERFORM JN-1 LAKE OUTFALL LINE COMPLETION SURVEY														
I089 Perform JN-1 Lake Outfall Line Completion Survey 1												I089 		
714-B32	\$ 2831	1	1		11JUL06	11JUL06	11JUL06	11JUL06						
714-B34 : REMEDIATE JN-2 UNDERGROUND TANK AND SUMP														
I100P PLAN: Remediate JN-2 Underground Tank and Sump 1										I100P 				
714-B34	\$ 10301	20	20		01JUN04	28JUN04	01JUN04	28JUN04						









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

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I100 Remediate JN-2 Underground Tank and Sump									Timenow	I100 				
714-B34 \$ 62770	22	22	28JUL04	26AUG04	28JUL04	26AUG04								
714-B35 : PERFORM JN-2 UNDERGROUND TANK/SUMP COMPLETE SURVEY														
I101 Perform JN-2 Underground Tank and Sump Completion Survey														
714-B35 \$ 3094	1	1	01OCT02	01OCT02	01OCT02	01OCT02								
714-B42 : PERFORM JN-3 REACTOR COOL PUMP TANK COMPLETION SURVEY														
I118 Perform JN-3 Reactor Coolant Pump Tank Completion Survey														
714-B42 \$ 3332	1	1	01OCT02	01OCT02	01OCT02	01OCT02								
714-B43 : REMEDIATE JN-3 DILUTION SUMP														
I124P PLAN: Remediate JN-3 Dilution Sump										I124P 				
714-B43 \$ 10301	20	20	03MAY04	28MAY04	03MAY04	28MAY04								
I124 Remediate JN-3 Dilution Sump										I124 				
714-B43 \$ 70461	24	24	23JUN04	27JUL04	23JUN04	27JUL04								
714-B44 : PERFORM JN-3 DILUTION SUMP COMPLETION SURVEY														
I125 Perform JN-3 Dilution Sump Completion Survey										I125 				
714-B44 \$ 3094	1	1	28JUL04	28JUL04	28JUL04	28JUL04								
714-B45 : LOCATE STORM/SANITARY SEWER LINE UTILITIES														
I133 Locate Storm Line Utilities										I133 				
714-B45 \$ 7083	18	18	02JUL04	28JUL04	02JUL04	28JUL04								
714-B46 : REMEDIATE STORM/SANITARY SEWER LINES														
I193P PLAN: Stabilize and Leave in Place Sanitary Drain Under Dam										I193P 				
714-B46 \$ 18780	20	20	26APR04	21MAY04	26APR04	21MAY04								
I196P PLAN: Remediate Sanitary Sewer Lines										I196P 				
714-B46 \$ 23780	20	20	03MAY04	28MAY04	03MAY04	28MAY04								
I138P PLAN: Remediate Storm Lines										I138P 				
714-B46 \$ 23780	20	20	01JUN04	28JUN04	01JUN04	28JUN04								












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I193 Stabilize and Leave in Place Sanitary Drain Under Dam 714-B46 \$ 32703 10 10 24JUN04 08JUL04 24JUN04 08JUL04										I193				
I196 Remediate Sanitary Sewer Lines 714-B46 \$ 646848 58 58 24JUN04 15SEP04 24JUN04 15SEP04										I196				
I138 Remediate Storm Lines 714-B46 \$ 466642 42 42 29JUL04 27SEP04 29JUL04 27SEP04										I138				
714-B47 : PERFORM STORM/SANITARY SEWER LINES COMPLETION SURVEY														
I197 Perform Sanitary Sewer Lines Completion Survey 714-B47 \$ 34273 12 12 16SEP04 01OCT04 16SEP04 01OCT04										I197				
I139 Perform Storm Lines Completion Survey 714-B47 \$ 40030 14 14 28SEP04 15OCT04 28SEP04 15OCT04										I139				
714-B48 : RELOCATE WEST JEFF NORTH UTILITIES AND REMEDIATE ROAD														
I143P PLAN: Relocate WJ North Utilities 714-B48 \$ 11078 60 60 15AUG03 07NOV03 15AUG03 07NOV03									I143P					
I143 Relocate WJ North Utilities 714-B48 \$ 108878 56 56 10NOV03 03FEB04 10NOV03 03FEB04									I143					
I145P PLAN: Remediate Road 714-B48 \$ 19324 20 20 15MAY06 12JUN06 15MAY06 12JUN06												I145P		
I145 Remediate Road 714-B48 \$ 124823 25 25 05JUL06 08AUG06 05JUL06 08AUG06												I145		
714-B49 : PERFORM ROAD COMPLETION SURVEY														
I146 Perform Road Completion Survey 714-B49 \$ 8450 3 3 09AUG06 11AUG06 09AUG06 11AUG06													I146	
714-B50 : REMEDIATE REMAINING 11.47 ACRES INSIDE FENCE														
I151P PLAN: Remediate Remaining 11.47 Acres Inside Fence 714-B50 \$ 18780 20 20 01OCT03 28OCT03 01OCT03 28OCT03									I151P					

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
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I151 Remediate Remaining 11.47 Acres Inside Fence 1										I 151				
714-B50	\$ 25089	7	7	05DEC03	15DEC03	05DEC03	15DEC03							
714-B51 : PERFORM REMAINING 11.47 ACRES INSIDE FENCE COMPLETION SURVEY														
I152 Perform Remaining 11.47 Acres Inside Fence Completion Survey 1										I 152				
714-B51	\$ 59272	21	21	16DEC03	19JAN04	16DEC03	19JAN04							
714-B52 : REMEDIATE JN-1 LAKE OUTFALL														
I156P PLAN: Remediate JN-1 Lake Outfall 1											I 156P			
714-B52	\$ 10035	10	10	12AUG05	25AUG05	12AUG05	25AUG05							
I156 Remediate JN-1 Lake Outfall 1											I 156			
714-B52	\$ 6876	2	2	26AUG05	29AUG05	26AUG05	29AUG05							
714-B53 : PERFORM JN-1 LAKE OUTFALL COMPLETION SURVEY														
I157 Perform JN-1 Lake Outfall Completion Survey 1											I 157			
714-B53	\$ 2891	1	1	30AUG05	30AUG05	30AUG05	30AUG05							
714-B54 : REMEDIATE JN-1 FRONT APRON														
I163P PLAN: Remediate JN-1 Front Apron 1												I 163P		
714-B54	\$ 19324	20	20	20APR06	17MAY06	20APR06	17MAY06							
I163 Remediate JN-1 Front Apron 1												I 163		
714-B54	\$ 130000	25	25	20JUN06	26JUL06	20JUN06	26JUL06							
714-B55 : PERFORM JN-1 FRONT APRON COMPLETION SURVEY														
I164 Perform JN-1 Front Apron Completion Survey 1												I 164		
714-B55	\$ 11281	4	4	27JUL06	01AUG06	27JUL06	01AUG06							
714-B56 : REMEDIATE JN-10/JN-11 GROUNDS														
I165P PLAN: Plan and Remediate JN-10/11 Grounds (columns/sanitary tank) 1												I 165P		
714-B56	\$ 32731	100	100	02OCT06	23FEB07	02OCT06	23FEB07							
I165 Plan and Remediate JN-10/11 Grounds (columns/sanitary tank) 1													I 165	
714-B56	\$ 243000	70	70	01MAR07	07JUN07	01MAR07	07JUN07							
714-B57 : BUILD JN-4 ACCESS ROAD														












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I176P PLAN: Build JN-4 Access Road									 Timenow					
714-B57	\$ 9455	39	39		01OCT02	22NOV02	01OCT02	22NOV02						
I176 Build JN-4 Access Road									176 					
714-B57	\$ 49647	10	10		30DEC02	13JAN03	30DEC02	13JAN03						
714-B58 : REMOVE RAD LAB TRAILER														
I179P PLAN: Remove Rad Lab Trailer														
714-B58	\$ 5552	5	5		01DEC06	07DEC06	01DEC06	07DEC06					I179P 	
I179 Remove Rad Lab Trailer														
714-B58	\$ 42099	20	20		20DEC06	19JAN07	20DEC06	19JAN07					I179 	
714-B59 : REMOVE AIR STATIONS AND WELLS														
I185P PLAN: Remove Wells														
714-B59	\$ 2517	5	5		02APR07	06APR07	02APR07	06APR07					I185P 	
I184 Remove Air Stations														
714-B59	\$ 837	1	1		12APR07	12APR07	12APR07	12APR07					I184 	
I185 Remove Wells														
714-B59	\$ 28536	4	4		12APR07	17APR07	12APR07	17APR07					I185 	
714-B60 : OBTAIN AND INSTALL NEW ACCESS CONTROL POINT														
I181P PLAN: Obtain and Install New Access Control Point														
714-B60	\$ 7721	20	20		01OCT02	28OCT02	01OCT02	28OCT02						
I181 Obtain and Install New Access Control Point														
714-B60	\$ 176923	40	40		29OCT02	27DEC02	29OCT02	27DEC02						
714-B61 : OBTAIN/INSTALL/LEASE COSTS FOR RAD LAB TRAILER														
I180P PLAN: Establish New Radioanalytical Laboratory (RAL)														
714-B61	\$ 139143	60	60		01OCT02	27DEC02	01OCT02	27DEC02						
I180 Establish New Radioanalytical Laboratory (RAL)									180 					
714-B61	\$ 669975	80	80		30DEC02	21APR03	30DEC02	21APR03						

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Battelle

BCLDP BASELINE: EXTERNAL AREAS

BAR LEGEND

Actuals
Forecast
Baseline

WORKPKG	BCOST	PCT	DJ	ROU	BSTART	BFINISH	ESDATE	EFOATE	01 OCT 02	01 OCT 03	01 OCT 04	01 OCT 05	01 OCT 06	01 OCT 07
I180A RAD Lab Trailer Leasing Costs									I180A					
714-B61	\$ 45364		924	924	22APR03	19DEC06	22APR03	19DEC06						
714-B62 : BACKFILL EXTERNAL AREAS INSIDE FENCE														
I182P PLAN: Backfill External Areas Inside Fence									I182P					
714-B62	\$ 2971		10	10	01FEB07	14FEB07	01FEB07	14FEB07						
I182 Backfill External Areas Inside Fence									I182					
714-B62	\$ 364039		6	6	01MAR07	08MAR07	01MAR07	08MAR07						
714-B63 : REMOVE REMAINING WEST JEFF END-STATE ITEMS														
I183P PLAN: Remove Remaining West Jeff End-State Items									I183P					
714-B63	\$ 6830		60	60	01NOV06	30JAN07	01NOV06	30JAN07						
I183 Remove Remaining West Jeff End-State Items									I183					
714-B63	\$ 464619		60	60	01MAR07	23MAY07	01MAR07	23MAY07						
714-B64 : JN-4 ISOLATION PLAN														
I198P PLAN: Develop JN-4 Isolation Plan									I198P					
714-B64	\$ 4758		20	20	01OCT02	28OCT02	01OCT02	28OCT02						
I198 Develop JN-4 Isolation Plan									I198					
714-B64	\$ 62860		40	40	29OCT02	27DEC02	29OCT02	27DEC02						
714-B65 : GROUNDWATER MONITORING/JN-1 & JN-3 DEWATERING/DATA														
IG002 Monitoring of wells and data analysis									IG002					
714-B65	\$ 714555		1100	1100	01OCT02	12FEB07	01OCT02	12FEB07						
IG007 Dewatering of JN-3									IG007					
714-B65	\$ 425201		450	450	28MAR03	10JAN05	28MAR03	10JAN05						
IG011 JN-1 dewatering									IG011					
714-B65	\$ 368468		850	850	12NOV03	29MAR07	12NOV03	29MAR07						
714-B66 : INSTALL GROUNDWATER WELLS/DISCHARGE/TESTING/ABANDONM														
IG003 Install water discharge/containment system for pumped water									IG003					
714-B66	\$ 47529		20	20	01OCT02	28OCT02	01OCT02	28OCT02						

WORKPKG	BCOST	PCT	DU	RDU	BSTART	BFINISH	ESDATE	EFDATE	01 OCT 02	01 OCT 03	01 OCT 04	01 OCT 05	01 OCT 06	01 OCT 07
IG005 Install 3 basal sand wells and 2 additional JN-3 dewatering wells 1									Timenow					
714-B66	\$ 124956		20	20	01OCT02	28OCT02	01OCT02	28OCT02						
IG004 Install 10 pits into 885 layer 1														
714-B66	\$ 94764		100	100	01NOV02	27MAR03	01NOV02	27MAR03						
IG006 Perform JN-3 pilot dewatering tests and drill Geoprobe borings 1														
714-B66	\$ 188111		100	100	01NOV02	27MAR03	01NOV02	27MAR03						
IG008 Install 2 855 downgradient wells, 5 downgradient 885 wells, JN1 3-we 1									IG008					
714-B66	\$ 181721		40	40	25APR03	20JUN03	25APR03	20JUN03						
IG009 Install JN-1 6 885 and 4 855 dewatering wells 1									IG009					
714-B66	\$ 240726		40	40	23JUN03	18AUG03	23JUN03	18AUG03						
IG010 Perform JN-1 pilot dewatering tests and Geoprobe borings 1									IG010					
714-B66	\$ 173082		60	60	19AUG03	11NOV03	19AUG03	11NOV03						
IG012 Disposition and abandonment of wells and discharge/containment sys 1													IG012	
714-B66	\$ 162491		40	40	30MAR07	24MAY07	30MAR07	24MAY07						
714-B67 : LOCKER ROOM/BREAK ROOM/REST ROOM TRAILER														
I200P PLAN: Install Locker room/Break room/Rest room Trailer and lease 1														
714-B67	\$ 10000		60	60	01OCT02	27DEC02	01OCT02	27DEC02						
I200 Install Locker room/Break room/Rest room Trailer and lease 1									200					
714-B67	\$ 290000		40	40	30DEC02	24FEB03	30DEC02	24FEB03						
1.7.I.5. WJ EXTERNAL AREAS CERTIFICATION AND RELEASE														
715-B02 : PREPARE FILTER BEDS AREA FINAL STATUS REPORT AND IVC														
IS005P PLAN: Conduct Filter Beds Area IVC 1											IS005P			
715-B02	\$ 3194		30	30	28FEB05	08APR05	28FEB05	08APR05						
IS004 Prepare Filter Beds Area Characterization and Final Status Report 1											IS004			
715-B02	\$ 52703		40	40	03MAR05	27APR05	03MAR05	27APR05						
IS005 Conduct Filter Beds Area IVC 1											IS005			
715-B02	\$ 62270		65	65	28APR05	01AUG05	28APR05	01AUG05						
715-B04 : PREPARE INSIDE FENCE/UNAFFECTED AREAS FINAL STATUS R														





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Battelle

BCLDP BASELINE: EXTERNAL AREAS

BAR LEGEND

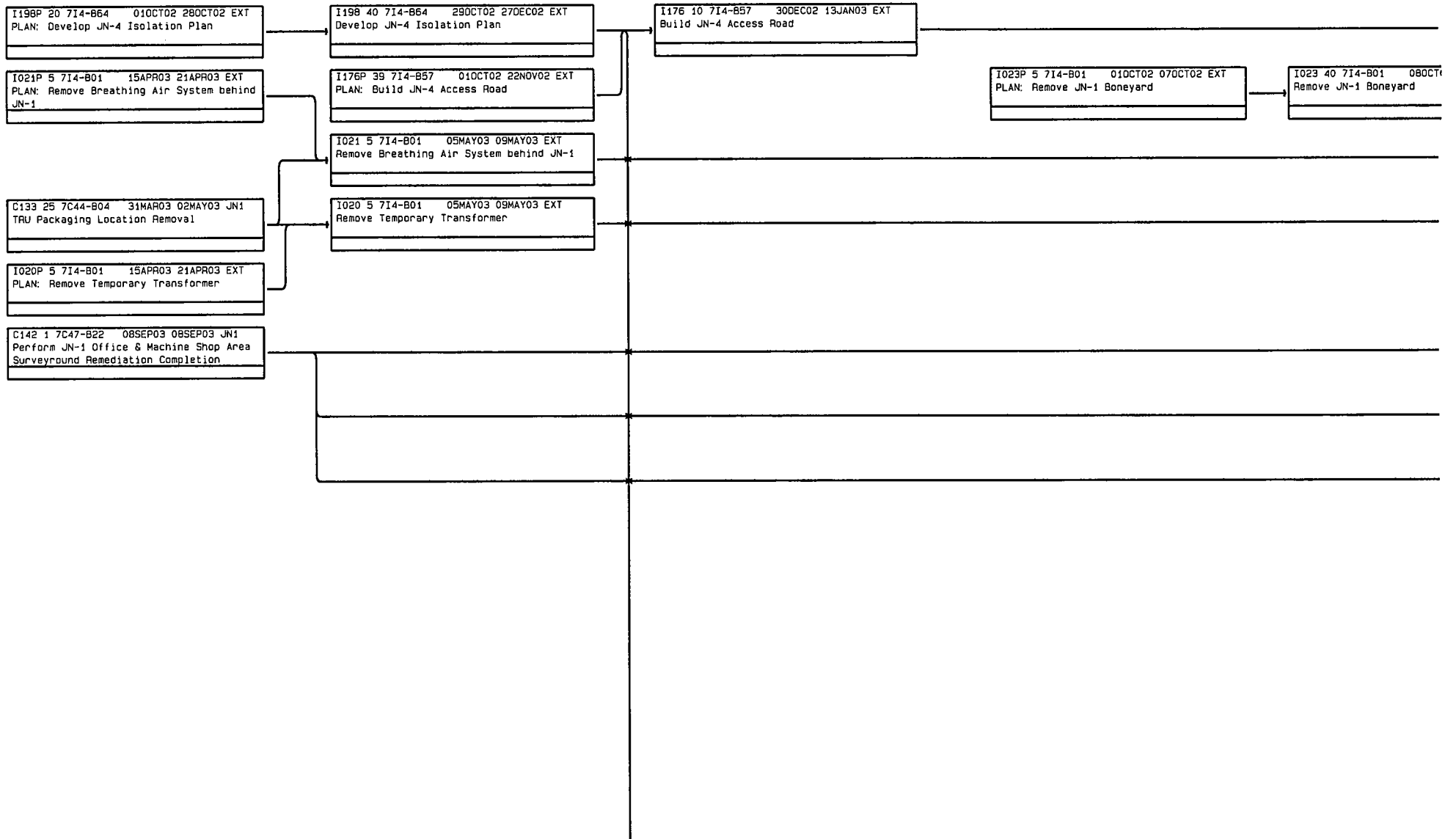
 Actuals
 Forecast
 Baseline

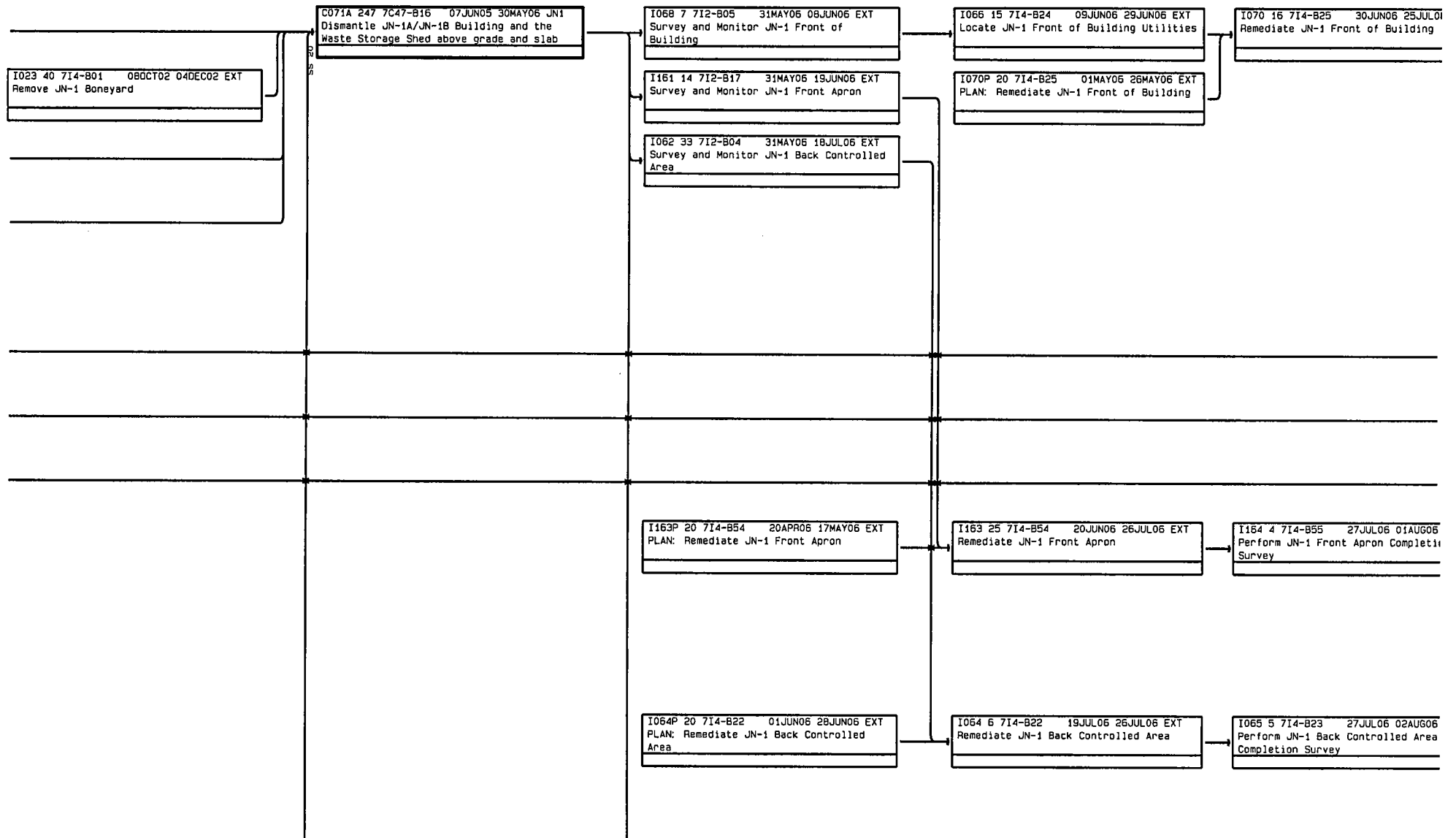
										01	01	01	01	01	01
										OCT	OCT	OCT	OCT	OCT	OCT
										02	03	04	05	06	07
WORKPKG	BCOST	PCT	DJ	ROU	BSTART	BFINISH	ESDATE	EFOATE		Timenow					
IS020P PLAN: Conduct General Inside Fence/Unaffected Areas IVC 1														IS020P	
715-B04	\$ 3194	30	30		20SEP06	31OCT06	20SEP06	31OCT06							
IS019 Prepare General Inside Fence/Unaffected Areas Characterization/Fin 1														IS019	
715-B04	\$ 52703	40	40		25SEP06	17NOV06	25SEP06	17NOV06							
IS020 Conduct General Inside Fence/Unaffected Areas IVC 1														IS020	
715-B04	\$ 66970	66	66		20NOV06	26FEB07	20NOV06	26FEB07							
715-B05 : PREPARE AND SUBMIT WEST JEFF NORTH CERTIFICATION DOCKET															
IS021 Prepare and Submit Certification Docket for West Jeff North Site 1														IS021	
715-B05	\$ 56047	30	30		01MAR07	11APR07	01MAR07	11APR07							

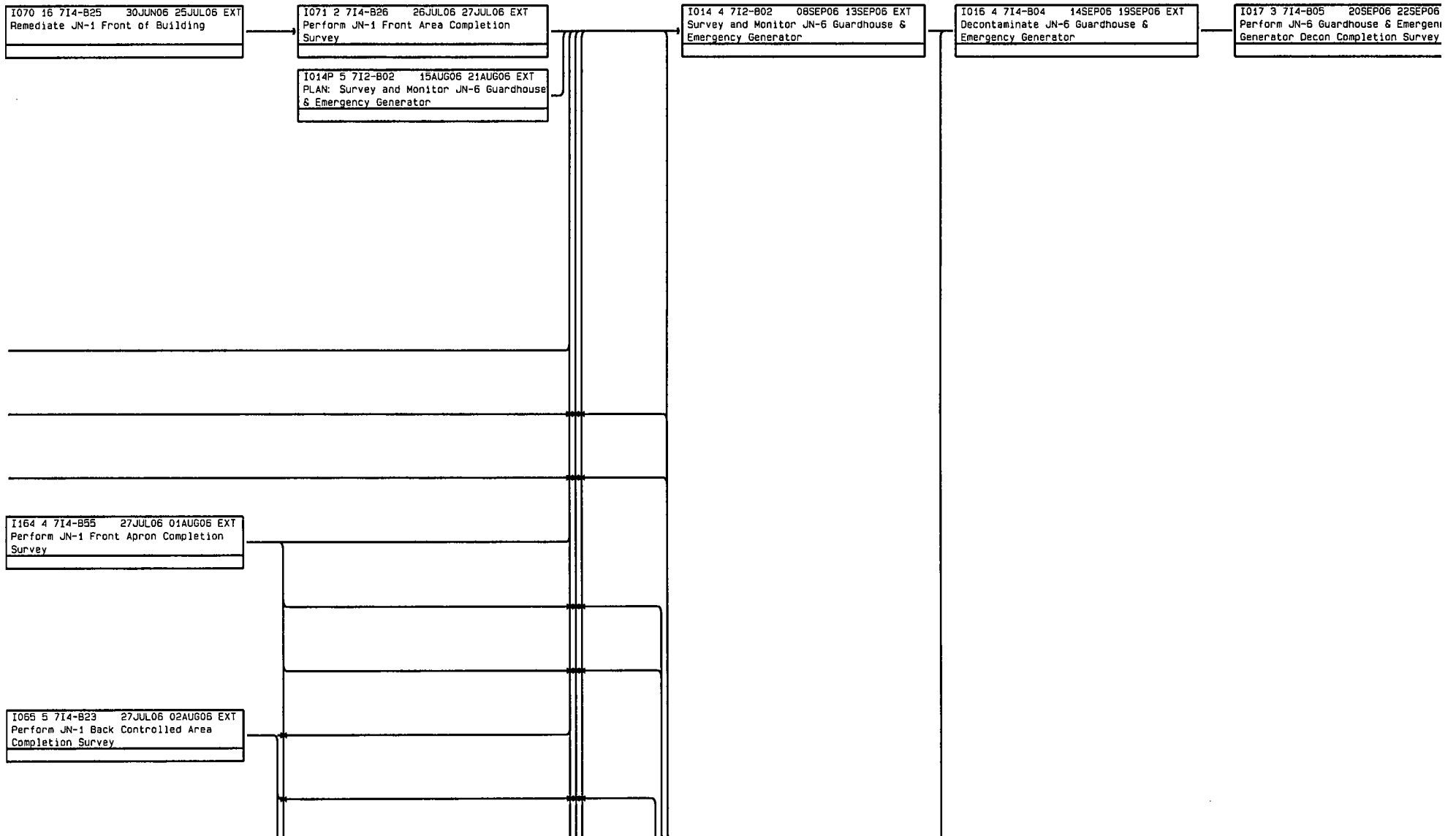
BCLDP BASELINE LOGIC: External Areas

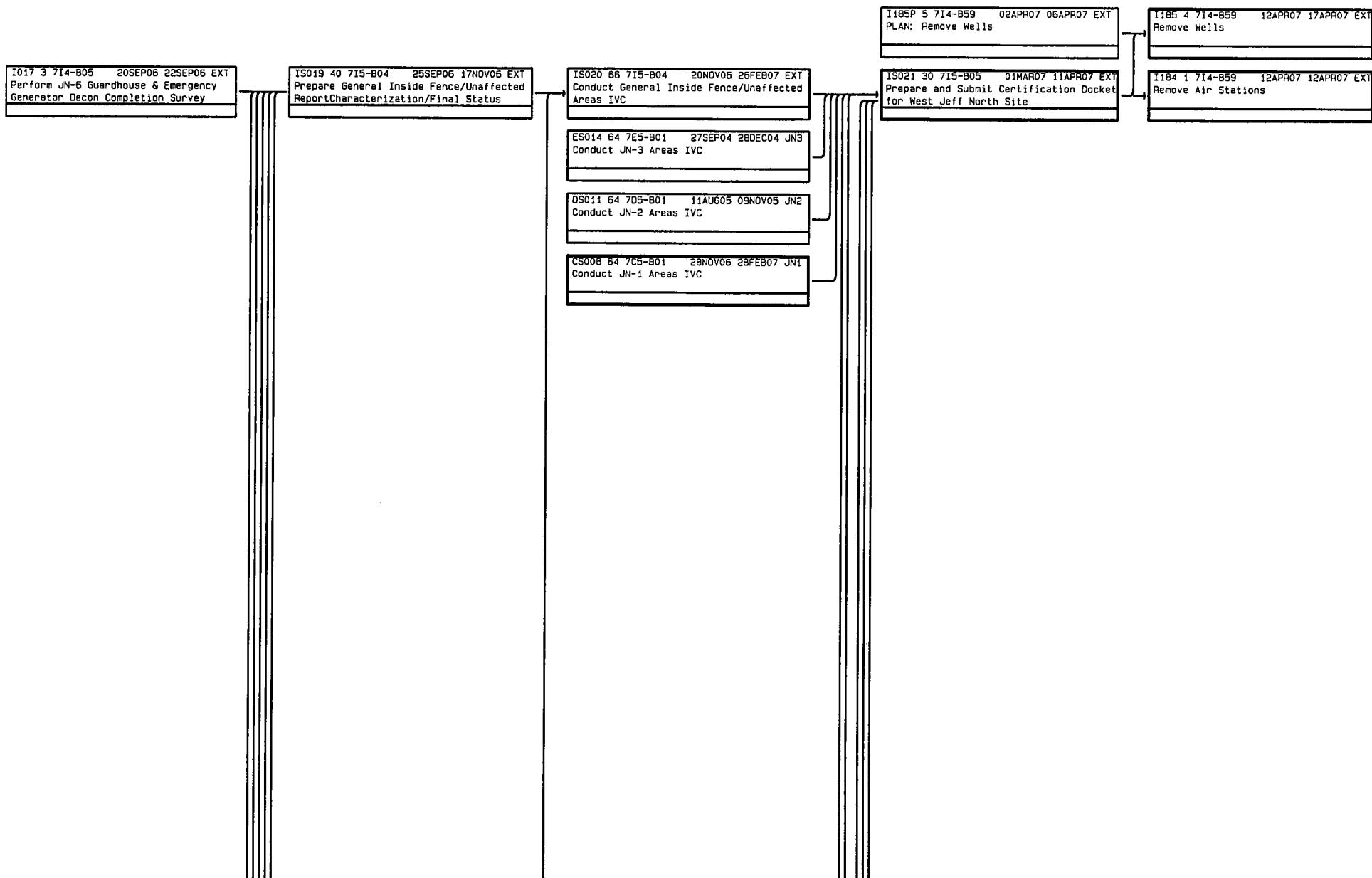
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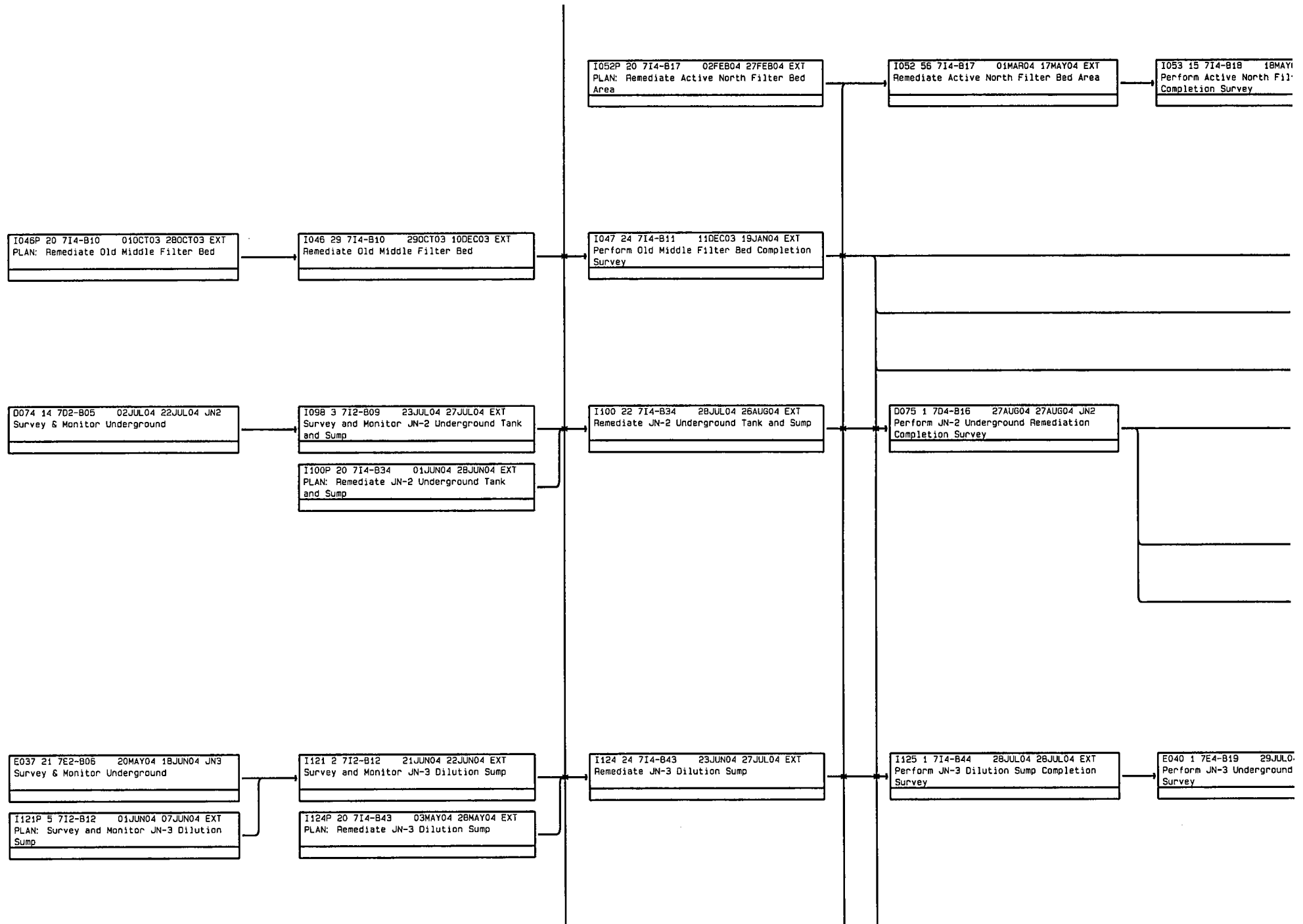
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I053 15 7I4-B18 18MAY04 08JUN04 EXT
Perform Active North Filter Bed
Completion Survey

I056P 5 7I2-B03 01MAY06 05MAY06 EXT
PLAN: Survey and Monitor JN-1 Back Apron

I056 24 7I2-B03 23MAY06 26JUN06 EXT
Survey and Monitor JN-1 Back Apron

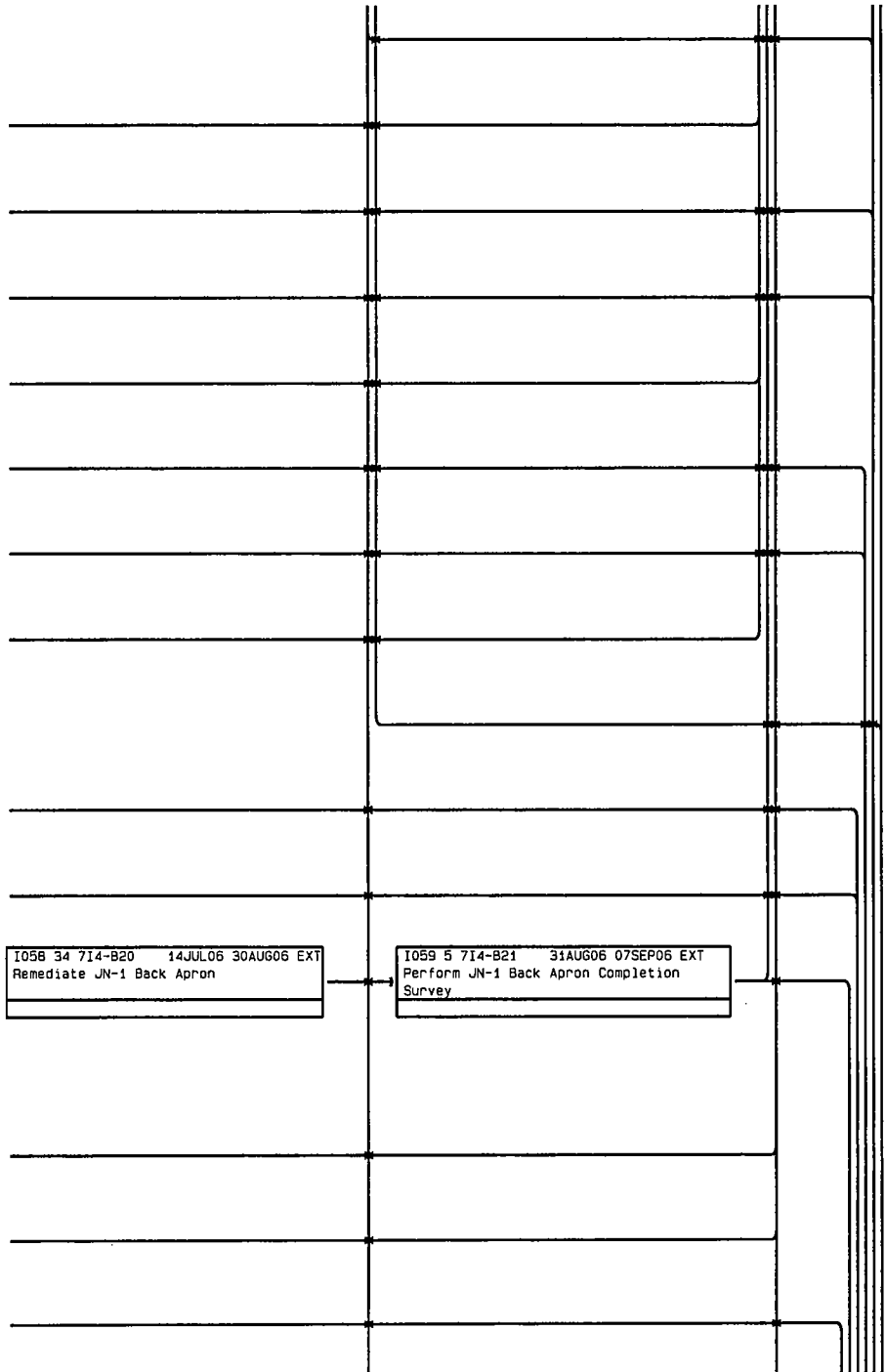
I054 11 7I4-B19 27JUN06 13JUL06 EXT
Locate JN-1 Back Apron Utilities

I058 34 7I4-B20 14JUL06 30AUG06
Remediate JN-1 Back Apron

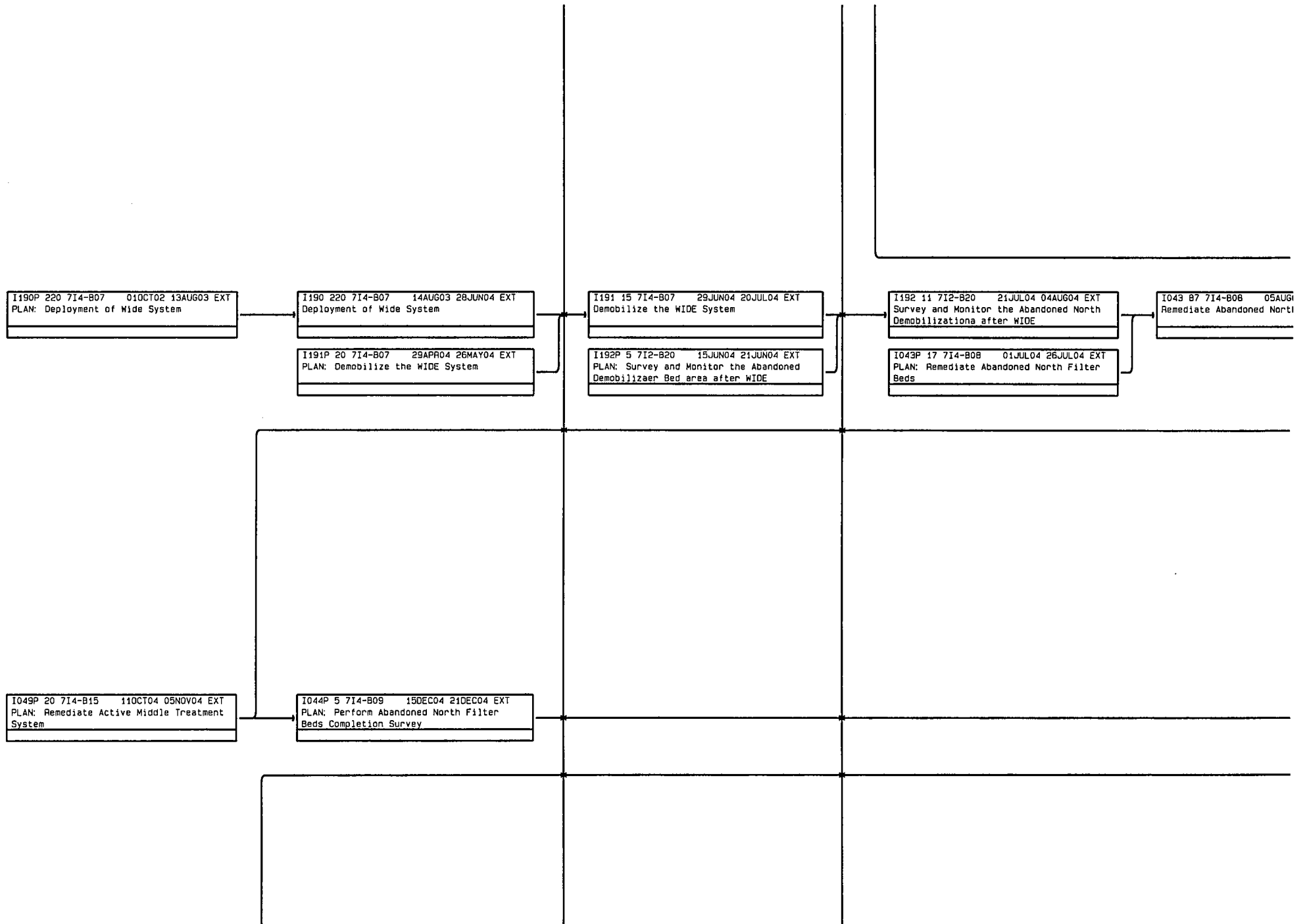
I058P 20 7I4-B20 01JUN06 28JUN06 EXT
PLAN: Remediate JN-1 Back Apron

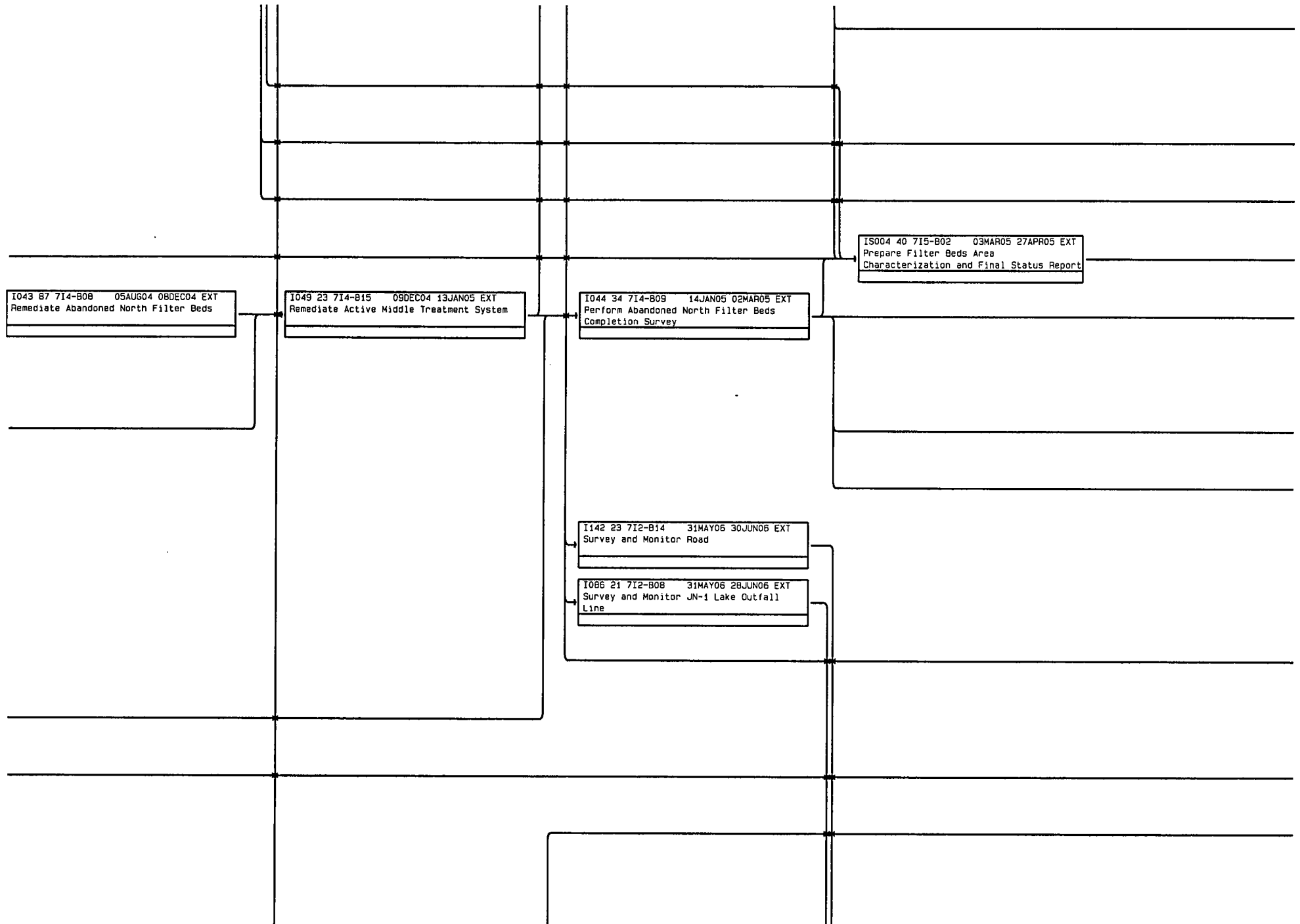
E040 1 7E4-B19 29JUL04 29JUL04 JN3
Perform JN-3 Underground Completion
Survey

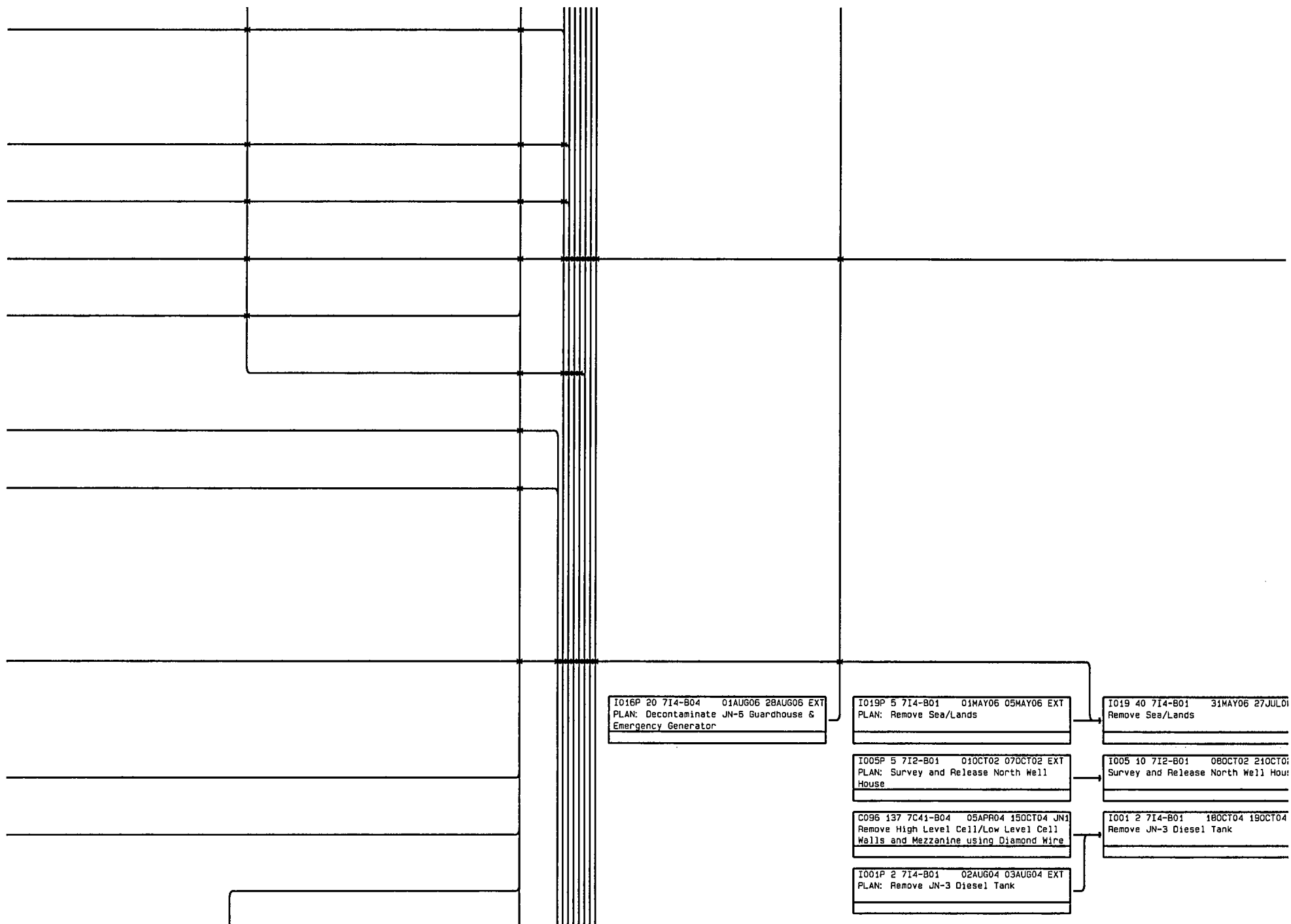
I050 11 7I4-B16 14JAN05 28JAN05 EXT
Perform Active Middle Treatment System
Bed Completion Survey



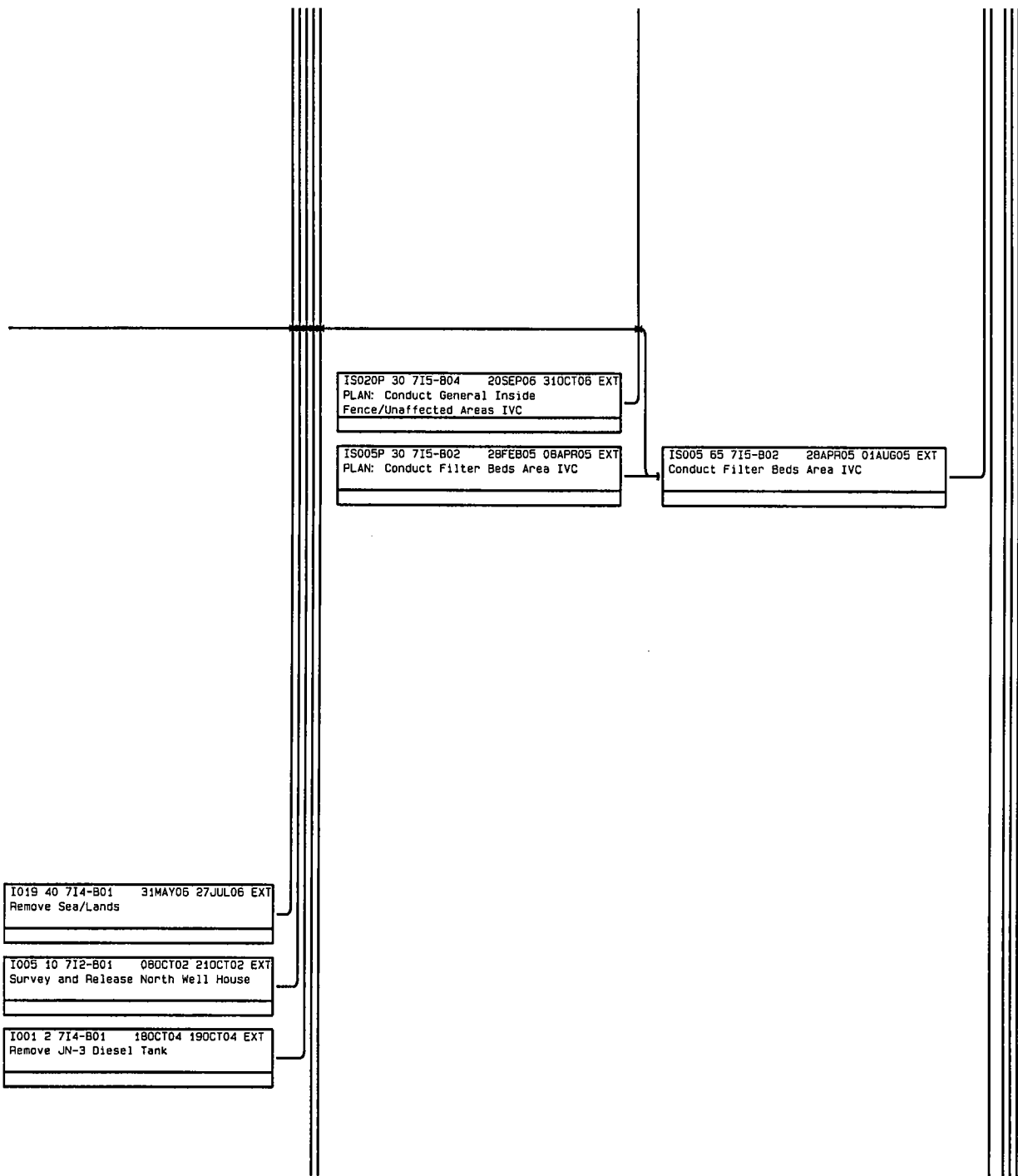


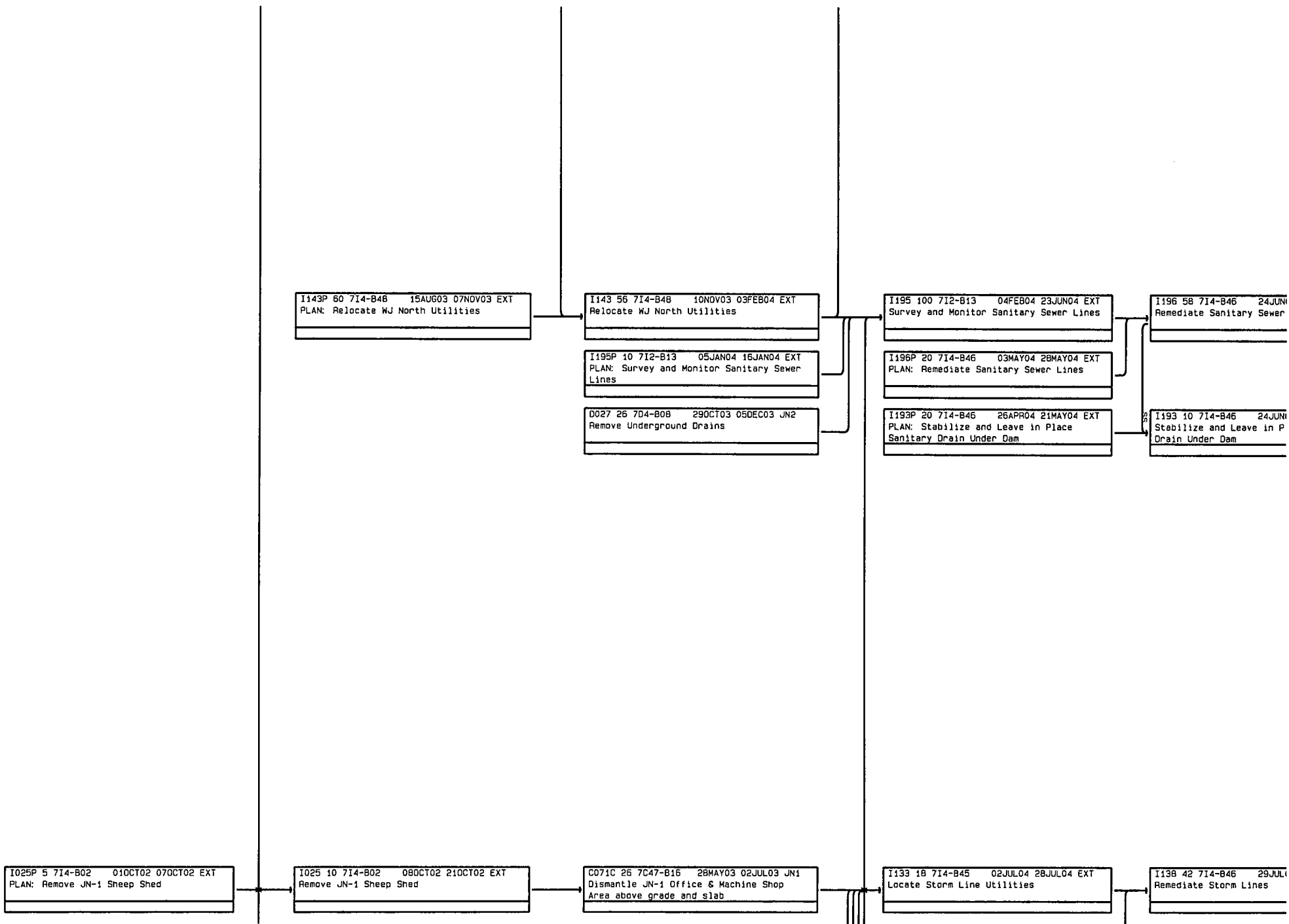


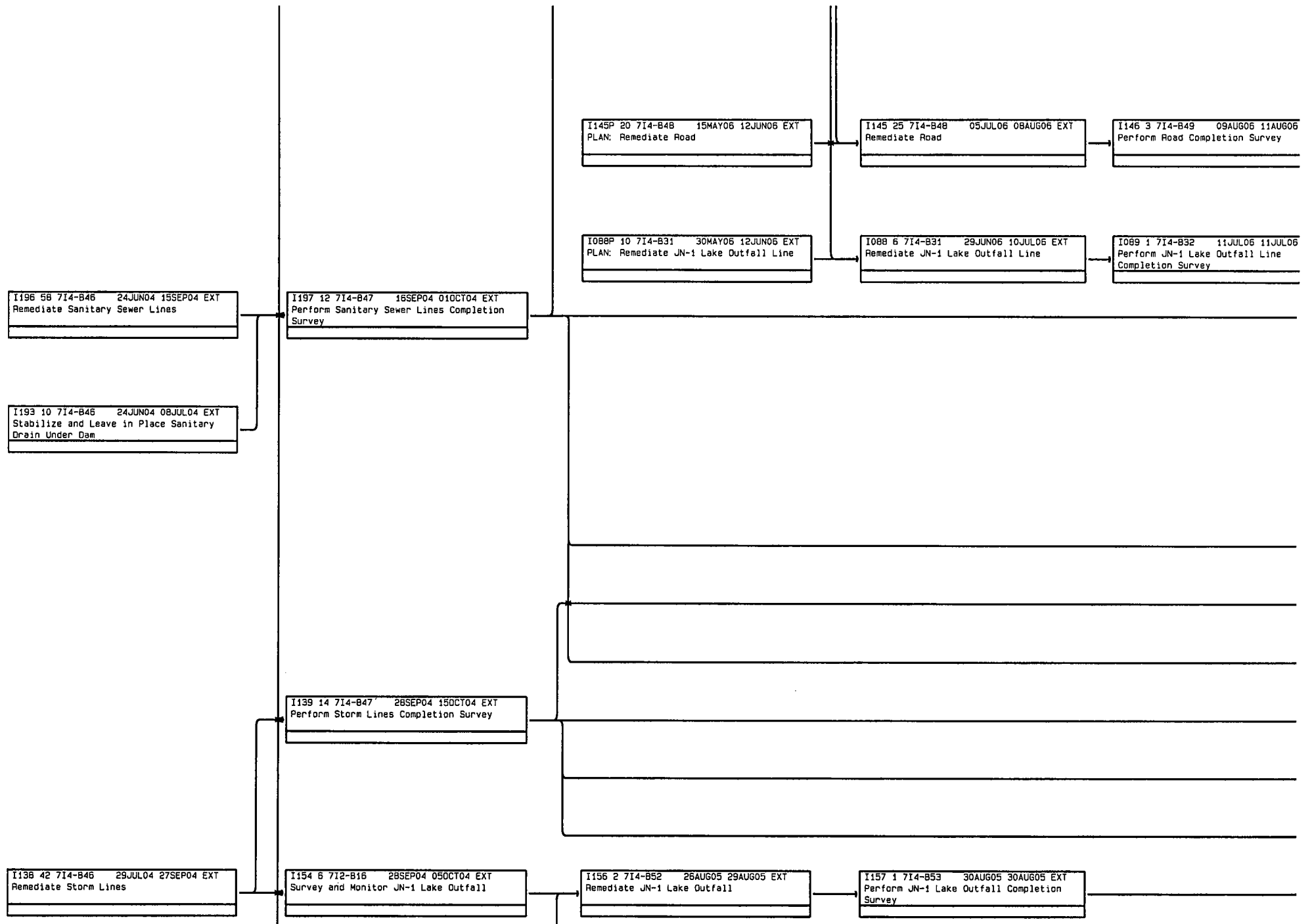


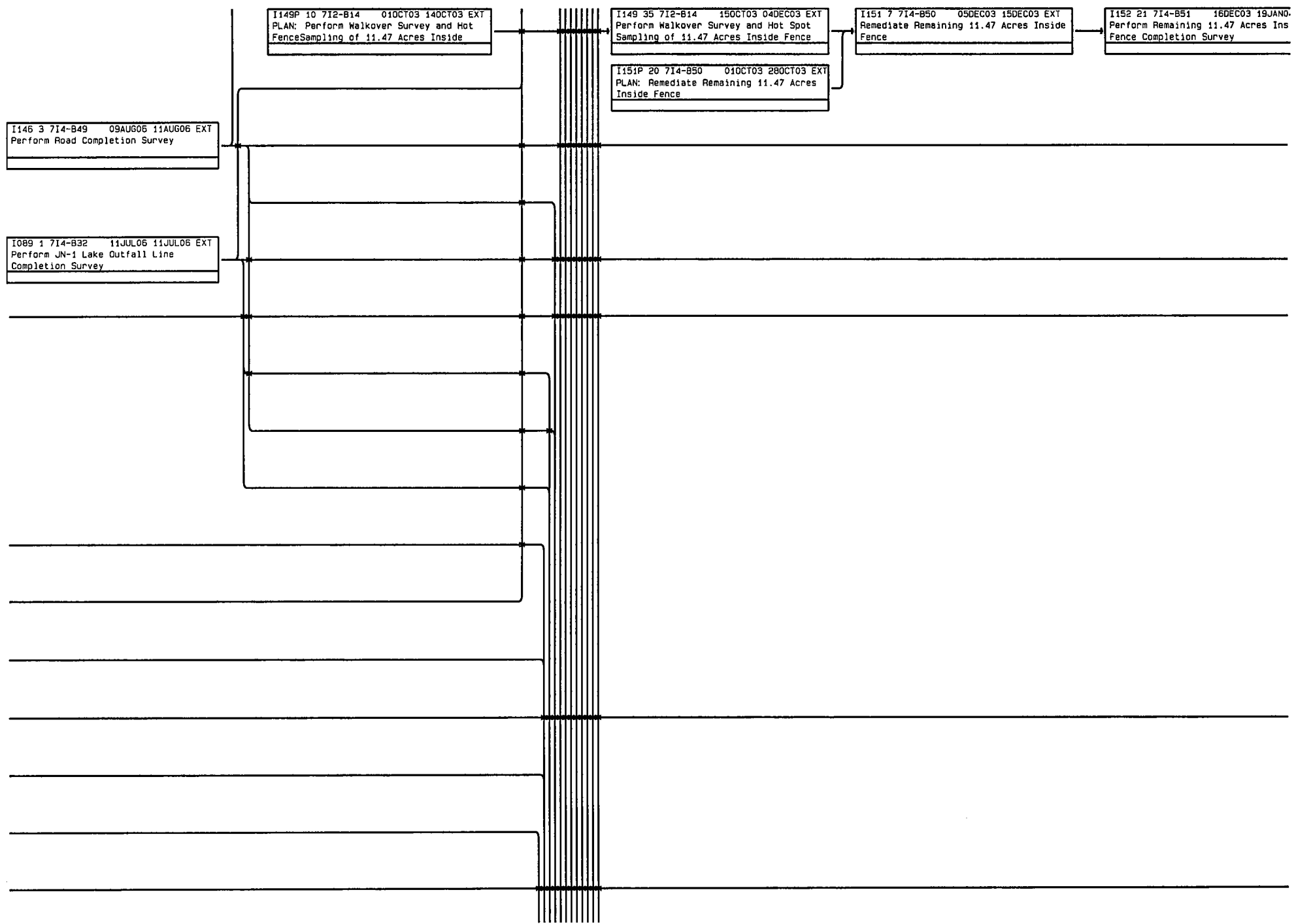


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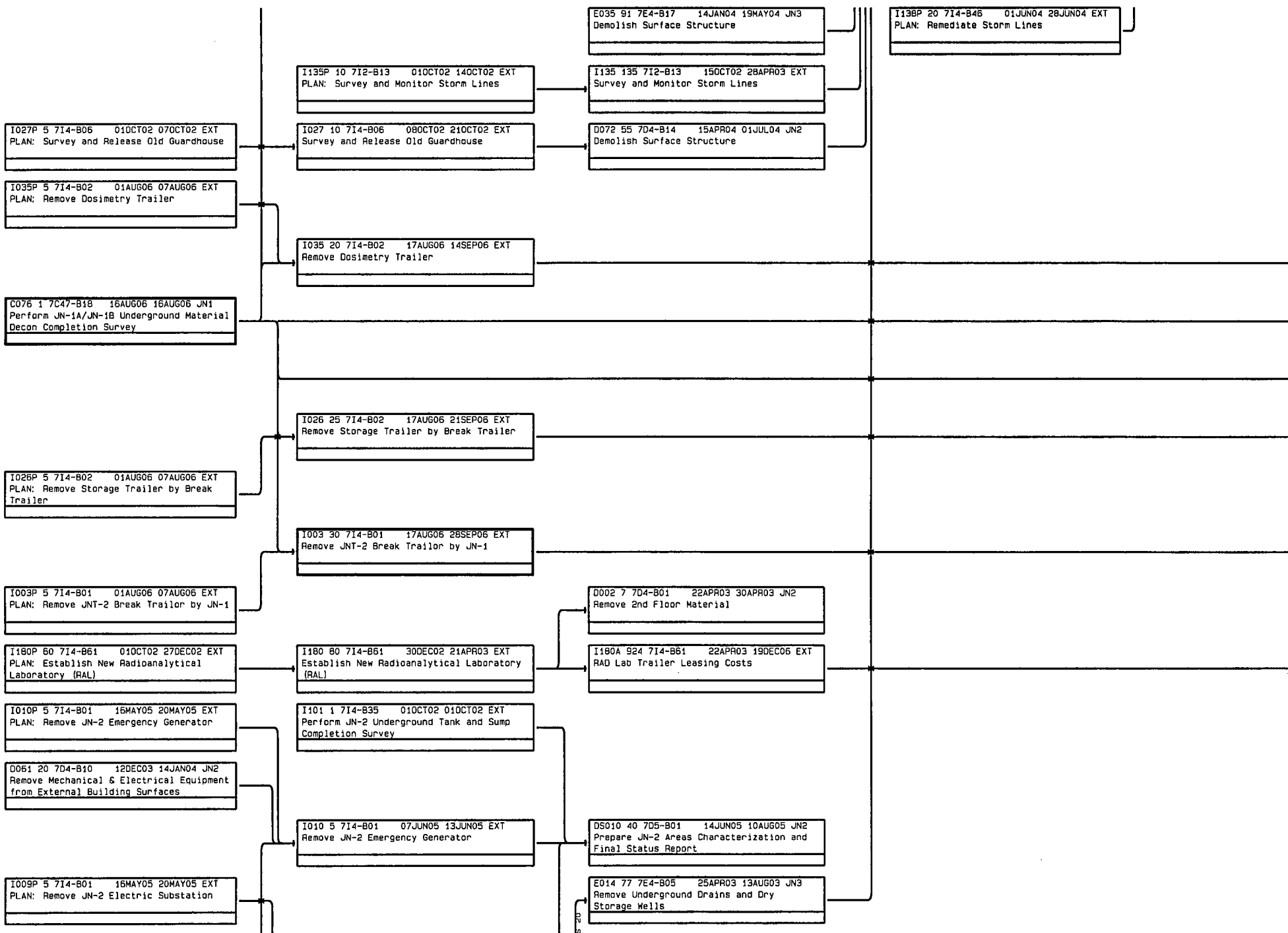






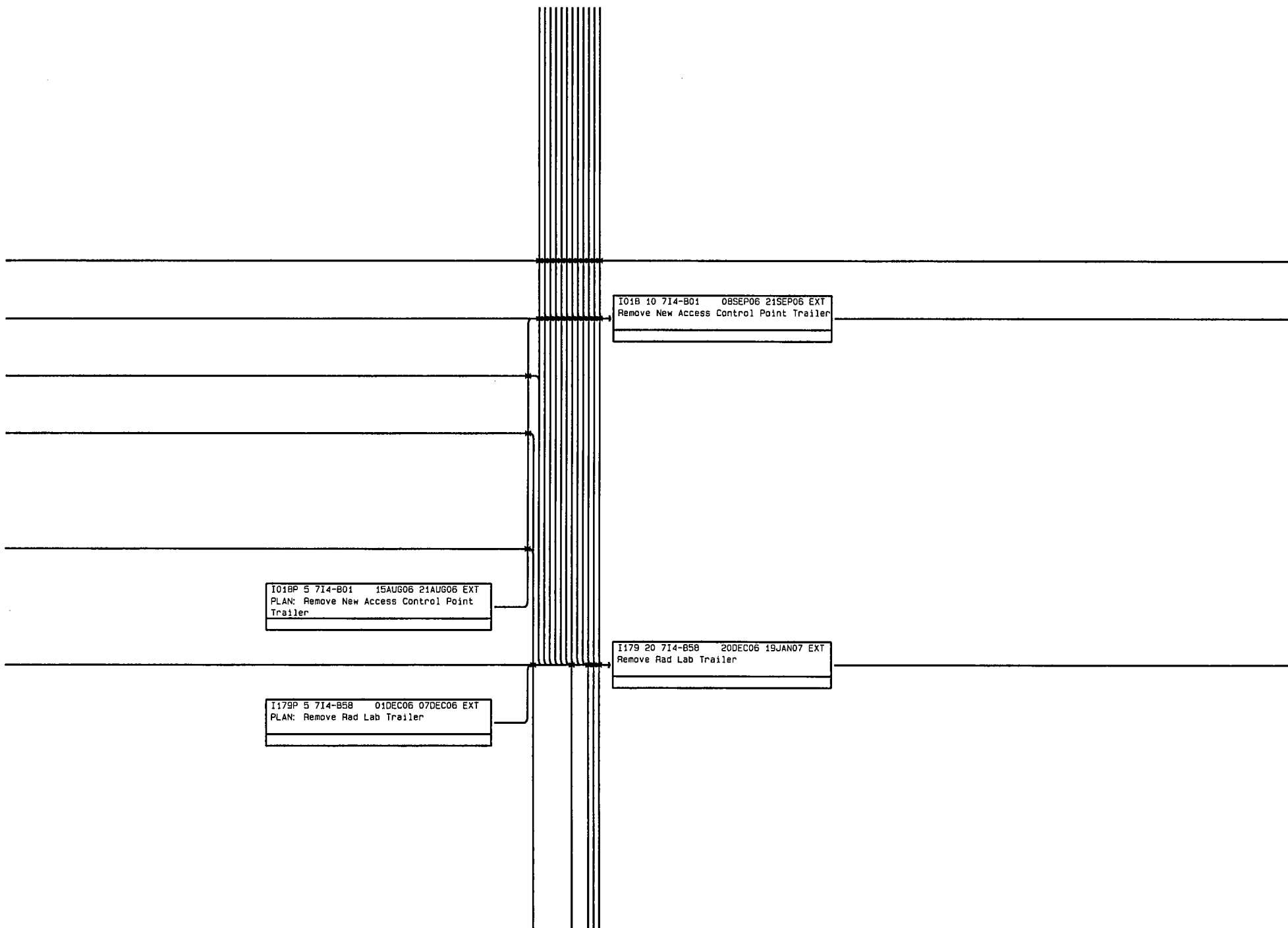
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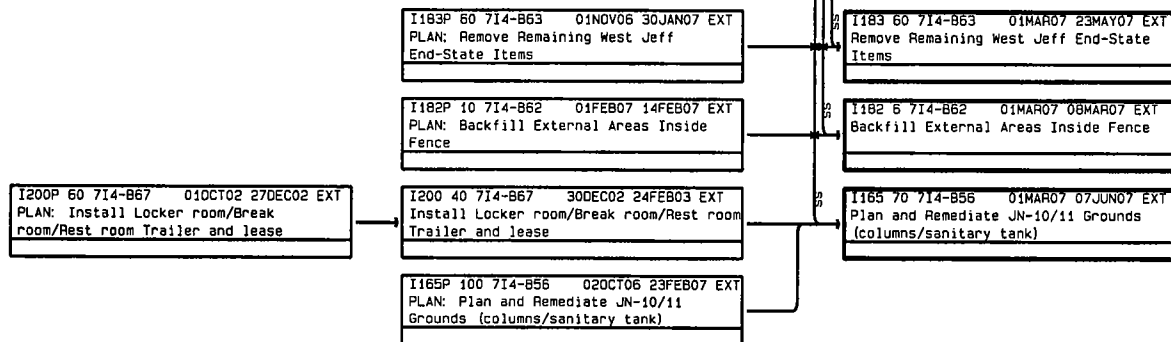
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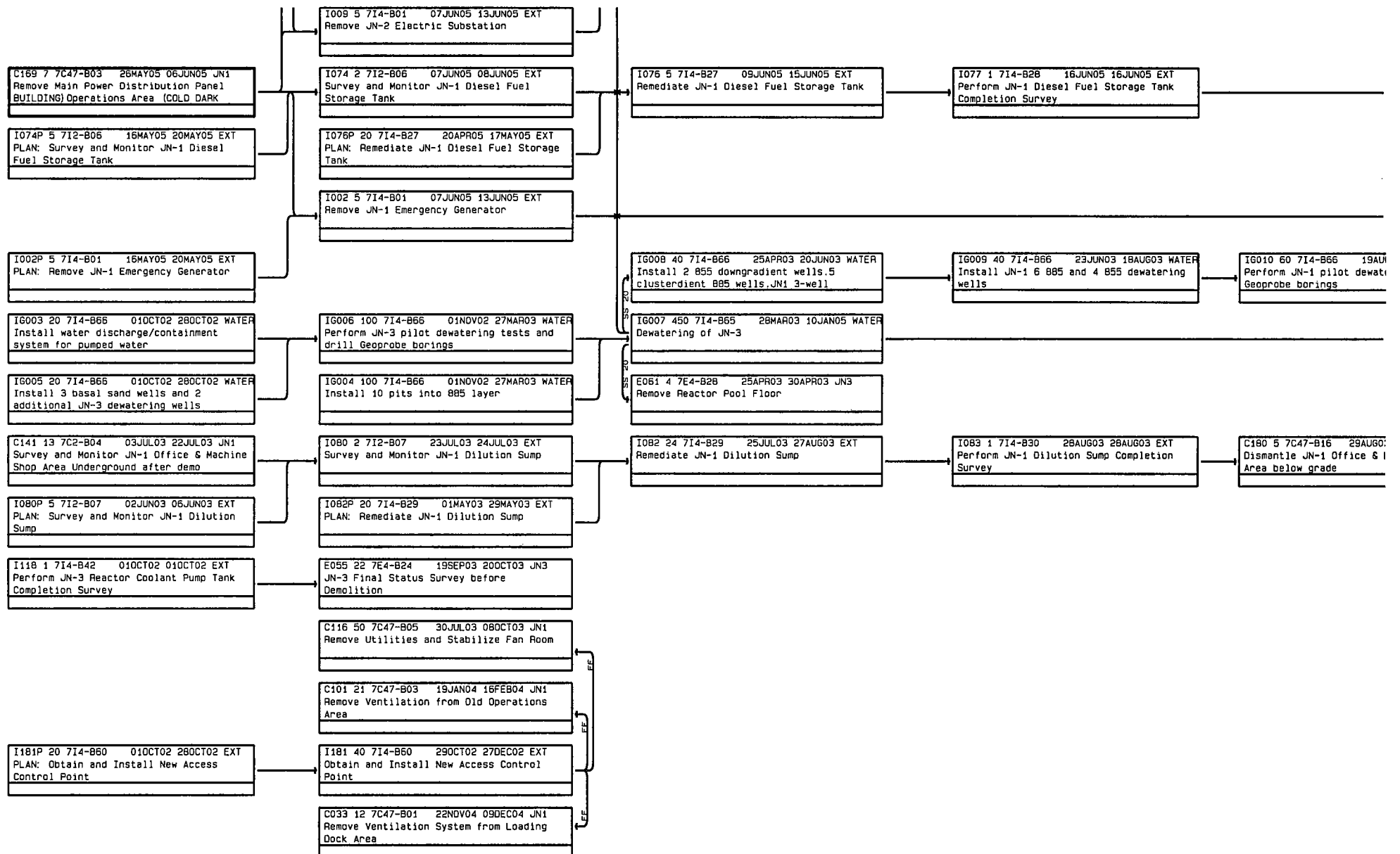


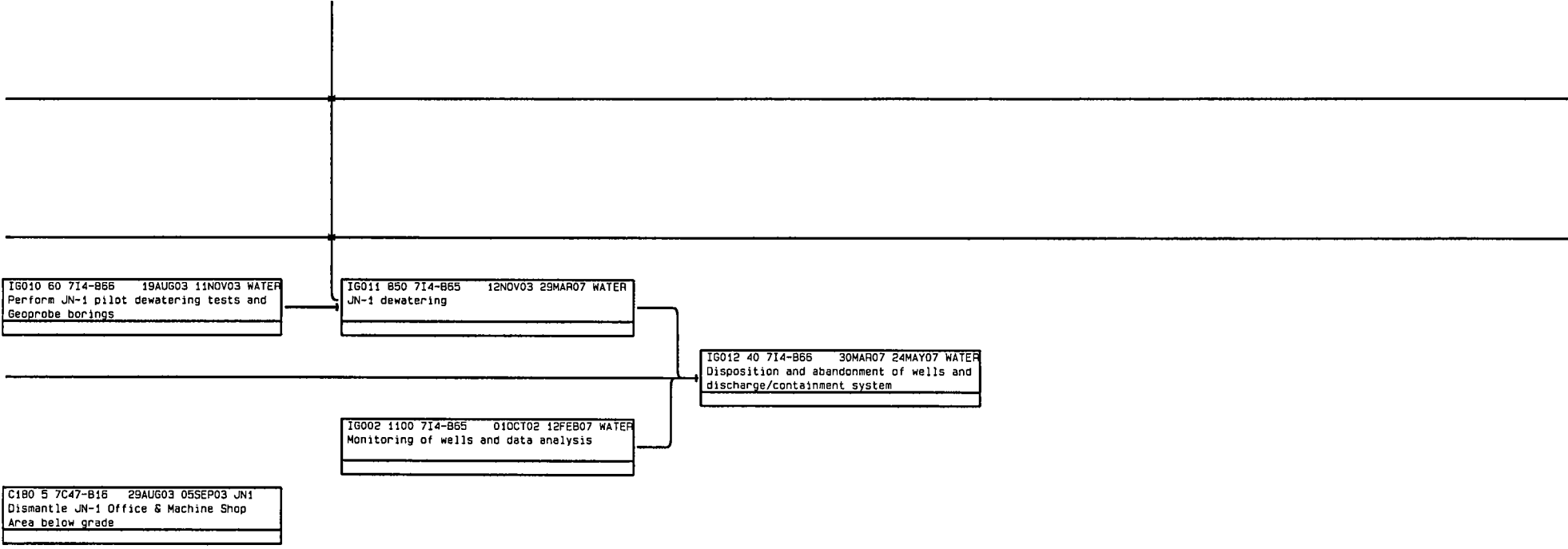
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I156P 10 714-852 12AUG05 25AUG05 EXT
PLAN: Remediate JN-1 Lake Outfall









CS007 40 705-B01 29SEP06 27NOV06 JN1
 Prepare JN-1 Areas Characterization and
 Final Status Report

F4

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I001

Work Pkg. No.: 7I4-B01

Function Name: Remove JN-3 Diesel Tank

Component Name: Diesel Tank located behind JN-3

Function Description: Remove the JN-1 Diesel Tank from behind the JN-1 facility.

Basis of Estimate

Strategy for Accomplishing Function: The tank will be free released and removed to a new location on Battelle property or disposed of as clean waste. The ground around the tank could require sampling to determine if ground due to diesel spills and possibly radioactive contamination.

Applicable Requirements/Procedures:

OAC 1301:7-9; DD-90-02; DD-93-04; DD-OP-090; HS-AP-2.0, 4.0, 5.0; HS-OP-001; HP-AP-1.0, 2.0, 5.0; HP-OP-011, 012, 019; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0

Input Descriptions:

- No longer a site need for diesel fuel storage.
- Material, waste and non-structural materials as described in Waste volumes & types FY 2001 and a physical walk down of the building

Output Descriptions:

Free Released Waste	200 cu ft
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Assumptions:

- The diesel tank can be removed when the need for stored diesel no longer exists or the tank can be moved to a released part of JN-4 for their needs.
- A total of 4 gamma spec samples will be taken.
- 1 offsite TCLP samples will be taken.
- The diesel-contaminated soil should be clean radiologically.
- The grounds will be radiologically released during the general area release by the Characterization Group.

Estimated Time to Plan the Work (Including Review and Approval): 2 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	2/2/4
Technical Advisors	HBTA	2/1/8
Project Manager/HP Manager	HBPM	2/2/10
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/1/8
Bartlett Health Physics	HRH	1/1/4

Estimated Time to Perform the Work: 2 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 2 / 2		
Project Manager/HP Manager	HBPM	2 / 2 / 4		
Task Leader	HBTL	1 / 2 / 16		
Battelle Technician	HBT	1 / 2 / 2		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	2 / 2 / 32		
Bartlett Maint Specialist	HRDS	1 / 2 / 4		
Bartlett Health Physics	HRH	1 / 2 / 16		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: TCLP – 1 soil sample = \$1,284

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 15 years experience in operational planning and execution in both private industry and DOE projects.

What experience is directly related to BCLDP? 5 years of direct experience in D&D of nuclear facilities within the DOE complex.

Did we apply a complexity factor during our thought process? The estimate was based on prior experience conducting similar work on the BCLDP. No complexity factor was used.

Completed by: P. Weaver

Date: 5/10/01

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I002

Work Pkg. No.: 7I4-B01

Function Name: Remove JN-1 Emergency Generator

Component Name: JN-1 Emergency generator

Function Description: Remove the JN-1 Emergency generator from behind the JN-1 facility.

Basis of Estimate

Strategy for Accomplishing Function: The Emergency generator will be free released and removed to a new location on Battelle property or disposed of as clean waste.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04; DD-OP-090; HS-AP-2.0, 4.0, 5.0; HS-OP-001; HP-AP-1.0, 2.0, 5.0; HP-OP-011, 012, 019; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; SC-SP-004.2; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020

Input Descriptions:

- No longer a site need for Emergency generator power.
- Material, waste and non-structural materials as described in Waste volumes & types FY 2001 and a physical walk down of the building

Output Descriptions:

LLW Non-compactable (Envirocare)	30 cu ft
Free Released Waste	325 cu ft

Assumptions:

1. The Emergency generator can be removed when the need for back up power no longer exists.
2. A total of 5 gamma spec and 1 alpha isotopic samples will be taken.
3. 2 offsite TCLP samples will be taken.
4. The diesel-contaminated pedestal, soil and asphalt are radiologically contaminated.
5. Due to the JN-1 generator pad being a part of the JN-1 apron removal only diesel contaminated items will be removed. Meaning the radiological contamination if found would be addressed in the apron removal.

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	2/2/4
Technical Advisors	HBTA	2/1/8
Project Manager/HP Manager	HBPM	2/5/20
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/1/8
Bartlett Health Physics	HRH	1/1/4

Estimated Time to Perform the Work: 5 days

Activity Number: I002

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 5 / 6		
Project Manager/HP Manager	HBPM	2 / 5 / 10		
Task Leader	HBTL	1 / 5 / 15		
Battelle Technician	HBT	1 / 5 / 5		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	2 / 5 / 80		
Bartlett Maint Specialist	HRDS	1 / 5 / 5		
Bartlett Health Physics	HRH	2 / 5 / 80		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material: 2 TCLP samples @ \$1,284 = \$2,568

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 15 years experience in operational planning and execution in both private industry and DOE projects.

What experience is directly related to BCLDP? 5 years of direct experience in D&D of nuclear facilities within the DOE complex.

Did we apply a complexity factor during our thought process? The estimate was based on prior experience conducting similar work on the BCLDP. No complexity factor was used.

Completed by: P. Weaver

Date: 5/10/01

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I003

Work Pkg. No.: 7I4-B01

Function Name: Remove Break Trailer by JN-1

Component Name: Break Trailer JNT-3

Function Description: Remove the Break Trailer from West Side of the JN-1 facility.

Basis of Estimate

Strategy for Accomplishing Function: The Break Trailer will be disposed of as radioactive waste and free released waste. The ground around and under the Break Trailer will fall into the general survey grid and be released along with the surrounding grounds.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04; HS-AP-2.0, 4.0, 5.0; HS-OP-001; HP-AP-1.0, 2.0, 5.0; HP-OP-011, 012, 019; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020

Input Descriptions:

- No longer a site need for the Break Trailer.
- Material, waste and non-structural materials as described in Waste volumes & types FY 2001 and a physical walk down of the building.

Output Descriptions:

LLW Over size Non-compactable (Envirocare)	800 cu ft
Free Released Waste	500 cu ft

Assumptions:

- The Break Trailer can be removed when there is no longer a need for a support facility.
- The frame, contents, and windows are just some of the waste that can be free released during removal.
- This trailer has had rodents in it that could have contaminated the inner walls and floor with low levels of contamination

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	2/2/4
Technical Advisors	HBTA	2/1/8
Project Manager/HP Manager	HBPM	2/5/20
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/1/8
Bartlett Health Physics	HRH	1/1/4

Estimated Time to Perform the Work: 25 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 25 / 25		
Project Manager/HP Manager	HBPM	2 / 25 / 50		
Task Leader	HBTL	1 / 25 / 50		
Battelle Technician	HBT	1 / 25 / 25		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	2 / 2 / 16		
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	3 / 25 / 500		
Bartlett Maint Specialist	HRDS	1 / 25 / 25		
Bartlett Health Physics	HRH	1 / 25 / 200		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 15 years experience in operational planning and execution in both private industry and DOE projects.

What experience is directly related to BCLDP? 5 years of direct experience in D&D of nuclear facilities within the DOE complex.

Did we apply a complexity factor during our thought process? The estimate was based on prior experience conducting similar work on the BCLDP. No complexity factor was used.

Completed by: P. Weaver

Date: 5/10/01

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I005

Work Pkg. No.: 7I2-B01

Function Name: Survey and Release North Well House

Component Name: North Well House

Function Description: Free release the North Well House located behind the JN-1 facility.

Basis of Estimate

Strategy for Accomplishing Function: The North Well House will be surveyed to verify no radioactive contamination is present and free released in place. Any localized contamination will be removed without tearing down the structure. The ground around the North Well House will fall into the general survey grid and be released along with the surrounding grounds.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04; HS-AP-2.0, 4.0, 5.0; HS-OP-001; HP-AP-1.0, 2.0, 5.0; HP-OP-011, 012, 019; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020

Input Descriptions:

- Material, waste and non-structural materials as described in Waste volumes & types FY 2001 and a physical walk down of the building

Output Descriptions:

LLW Non-compactable (Envirocare)	20 cu ft
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Assumptions:

- The North Well House can be free released and will not be used for any further activities such as storage.
- The North Well House might have some waste that will be disposed of a LLW due to inaccessible surfaces or areas that rodents could have contaminated.

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	2/2/4
Technical Advisors	HBTA	2/1/8
Project Manager/HP Manager	HBPM	2/5/20
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/1/8
Bartlett Health Physics	HRH	1/1/4

Estimated Time to Perform the Work: 10 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 10 / 10		
Project Manager/HP Manager	HBPM	2 / 10 / 10		
Task Leader	HBTL	1 / 10 / 10		
Battelle Technician	HBT	1 / 10 / 10		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	1 / 1 / 8		
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	2 / 5 / 80		
Bartlett Maint Specialist	HRDS	1 / 10 / 20		
Bartlett Health Physics	HRH	2 / 10 / 120		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 15 years experience in operational planning and execution in both private industry and DOE projects.

What experience is directly related to BCLDP? 5 years of direct experience in D&D of nuclear facilities within the DOE complex.

Did we apply a complexity factor during our thought process? The estimate was based on prior experience conducting similar work on the BCLDP. No complexity factor was used.

Completed by: P. Weaver

Date: 5/31/01

Rev. No.: 1

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I009

Work Pkg. No.: 7I4-B01

Function Name: Remove JN-2 Electric Substation

Component Name: JN-2 Electric Substation

Function Description: Remove the JN-2 Electric Substation from North side of the JN-2 facility.

Basis of Estimate

Strategy for Accomplishing Function: The Electric Substation will be free released and removed to a new location on Battelle property or disposed of as clean waste. The ground around the Electric Substation will require sampling to determine the required clean up.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04; DD-OP-090; HS-AP-2.0, 4.0, 5.0; HS-OP-001; HP-AP-1.0, 2.0, 5.0; HP-OP-011, 012, 019; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; SIH-PP-04; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020

Input Descriptions:

- No longer a site need for power.
- Material, waste and non-structural materials as described in Waste volumes & types FY 2001 and a physical walk down of the building

Output Descriptions:

LLW Non-compactable (Envirocare)	80 cu ft
Free Released Waste	1725 cu ft

Assumptions: The Electric Substation can be removed when the need for back power no longer exists.

- A total of 4 gamma spec and 1 alpha isotopic samples will be taken.
- 1 offsite PCB sample could be taken.
- The concrete pad and soil will not be radiologically contaminated.

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	2/2/4
Technical Advisors	HBTA	2/1/8
Project Manager/HP Manager	HBPM	2/5/20
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/1/8
Bartlett Health Physics	HRH	1/1/4

Estimated Time to Perform the Work: 10 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 10 / 10		
Project Manager/HP Manager	HBPM	2 / 10 / 20		
Task Leader	HBTL	1 / 10 / 30		
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	2 / 10 / 80		
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF	1 / 5 / 20		
Bartlett Technician	HRD	2 / 10 / 160		
Bartlett Maint Specialist	HRDS	1 / 10 / 10		
Bartlett Health Physics	HRH	1 / 10 / 80		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material: 1 TCLP sample @ \$1,284 = \$1,284

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 15 years experience in operational planning and execution in both private industry and DOE projects.

What experience is directly related to BCLDP? 5 years of direct experience in D&D of nuclear facilities within the DOE complex.

Did we apply a complexity factor during our thought process? The estimate was based on prior experience conducting similar work on the BCLDP. No complexity factor was used.

Completed by: P. Weaver

Date: 5/10/01

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I010

Work Pkg. No.: 7I4-B01

Function Name: Remove JN-2 Emergency generator

Component Name: JN-2 Emergency generator

Function Description: Remove the JN-2 Emergency generator from behind the JN-2 facility.

Basis of Estimate

Strategy for Accomplishing Function: The Emergency generator will be free released and removed to a new location on Battelle property or disposed of as clean waste. The ground around the Emergency generator will require sampling to determine if ground redemption will need to take place.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04; DD-OP-090; HS-AP-2.0, 4.0, 5.0; HS-OP-001; HP-AP-1.0, 2.0, 5.0; HP-OP-011, 012, 019; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; SC-AP-004.2; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020

Input Descriptions:

- No longer a site need for Emergency generator power.
- Material, waste and non-structural materials as described in Waste volumes & types FY 2001 and a physical walk down of the building

Output Descriptions:

LLW Non-compactable (Envirocare)	25 cu ft
Free Released Waste	100 cu ft

Assumptions:

1. The Emergency generator can be removed when the need for back up power no longer exists.
2. A total of 14 gamma spec and 1 alpha isotopic samples will be taken.
3. 1 offsite samples could be taken.
4. The diesel-contaminated pedestal and soil should not be radiologically contaminated.

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	2/2/4
Technical Advisors	HBTA	2/1/8
Project Manager/HP Manager	HBPM	2/5/20
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/1/8
Bartlett Health Physics	HRH	1/1/4

Estimated Time to Perform the Work: 5 days

Activity Number: I010

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 5 / 6		
Project Manager/HP Manager	HBPM	2 / 5 / 10		
Task Leader	HBTL	1 / 5 / 15		
Battelle Technician	HBT	1 / 5 / 5		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	1 / 2 / 16		
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	2 / 5 / 80		
Bartlett Maint Specialist	HRDS	1 / 5 / 5		
Bartlett Health Physics	HRH	1 / 5 / 40		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 15 years experience in operational planning and execution in both private industry and DOE projects.

What experience is directly related to BCLDP? 5 years of direct experience in D&D of nuclear facilities within the DOE complex.

Did we apply a complexity factor during our thought process? The estimate was based on prior experience conducting similar work on the BCLDP. No complexity factor was used.

Completed by: P. Weaver

Date: 5/10/01

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I014

Work Pkg. No.: 7I2-B02

Function Name: Survey and Monitor JN-6 Guard House & Emergency Generator

Component Name: JN-6 Guard House

Function Description: Baseline Characterization of the JN-6 Guard House

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Rooms and Areas that have undergone material and M&E removal

Output Descriptions:

1. Establish material backgrounds
2. Establish material Decision Level Values (DLV)
3. Smears to lab 1 per 3 grids (~65) R smear
4. 2 gamma spectrum and 1 alpha isotopic sample
5. Data to report generation

Assumptions:

Establish Background & DLVs:

1. 3 types of materials exist
2. (40) 1 minute measurements for alpha + beta window per material
3. (40) 1 minute measurements alpha material per window
4. 3 minute prep/setup/ taking floor and lower wall readings (100%)= 12 hrs
5. 1.25 hr to establish DLV for each material (spreadsheet)

Survey:

1. 100% of all floor area will be surveyed.
2. 100% of all wall area up to 2m will be surveyed.
3. 120% of all ceilings will be surveyed (20% added for horizontal surfaces)
4. 10% or 30sq. meters whichever is larger of wall areas greater than 2m will be monitored
5. 100% of exterior monitored.
6. Normal rate for characterization surveys is 6 square meters per technician-hour
7. Ladder rate for characterization surveys is 5 square meters per technician-hour
8. Drain Samples 2/hr; 2 samples total
9. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels > DLV , alpha, alpha+beta 2min counts required, perform smears.
10. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
11. WI takes 24 hr to prepare/Safety Prof. 8hr for WI/SCL/6 Prof @ 2 hr For Rev/ Appr.
12. Initial Instrument Calibration 8hrs +10% time
13. No significant down time

14. See Assump. D006

Data Technician:

1. Technician inputs 3 data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background
4. Floor 2 estimated to have 195 grids---130 smear results.

Estimated Time to Plan the Work (Including Review and Approval): 5 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	3/4/32
Technical Advisors	HBTA	3/3/20
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	1/1/8
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 4 work days for survey

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/4/8	NA	NA
Technical Advisors (Safety)	HBTA	1/4/4	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/4/16	0	4
Battelle Technician (HP)	HBT	1/4/32	0	5
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/4/88	0	24
(Data)		1/4/14	NA	NA
		1/4/28	NA	NA

Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is Estimator's Experience?

15 years of health physics & radiological release program management

What Experience is directly related to BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a Complexity Factor Used?

No, work similar to that performed at KA

Completed by: J.F. POLIZIANI

Date: 5/15/00

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

Activity No.: I016

Work Pkg. No.: 7I4-B04

Function Name: Decontaminate JN-6 Guardhouse & Emergency Generator

Component Name: JN-6 Guardhouse & Emergency Generator

Function Description: Prepare work control documents and submit to DOE for authorization to perform surface decontamination. With authorization from DOE, assemble material resources & work crew and decontaminate designated surfaces according to work instruction.

Basis of Estimate

Strategy for Accomplishing Function: Work control documents including Work Instruction, Safety & Waste Management Checklists, Characterization data sheets, and RWP will be prepared and submitted to DOE for authorization to perform work. With DOE authorization, brief work crews on scope of activities, procedures, radiological & safety concerns and requirements. Assemble materials, equipment and supplies; institute radiological and engineering controls & perform decontamination activities with Characterization support to monitor progress and determine completion.

Applicable Requirements/Procedures/Work Instructions:

DD-90-02; DD-93-02, 04; DD-CP-004, 030; DD-OP-029, 065, 075, 077, 195, 215; HP-AP-1.0, 2.0, 5.0, 9.0, 11.0, 15.0, 19.0; HP-OP-011, 012, 017, 018, 019, 023; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; SIH-PP-06; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020

Input Descriptions:

1. Demarcated building surfaces for decontamination (36 sq ft floors)
2. Characterization data
3. Decon equipment: Hilti guns, HEPA Vacs, portable enclosures, waste containers.

Output Descriptions:

1. Building surfaces minus contamination
2. Completion survey data
3. Completed Work Instruction data package
4. Containerized LLW:
 - Concrete rubble & HEPA filters – 4 cu ft
 - Job control waste (compactable) – 27 cu ft

Assumptions:

1. Building surface contamination is 5% of floors, all at ground level.
2. No contamination is found on ceilings or walls.
3. Contamination can be removed using Group 1 PPE by employing hooded HEPA enclosures at point of contact.
4. Surfaces can be scabbled to a depth of ¼ inch using Hilti guns at a rate of 50 sq ft per crew day.
5. Production rate is approximately 25 sq ft per day with 1 scabbler.
6. No contamination is found on the outdoor emergency generator.

Estimated Time to Plan the Work (Including Review and Approval): 20 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	1 / 10 / 10
Project Manager/HP Manager	HBPM	2 / 10 / 40
Task Leader	HBTL	1 / 10 / 20
Secretary/Clerical	HBS	1 / 10 / 10
Support Professional	HBP	
Bartlett Health Physics	HRH	1 / 5 / 5

Estimated Time to Perform the Work: 4 days including 1½ days to set up the area, 1 day to decontaminate, and 1½ days to recover.

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 4 / 4		
Project Manager/HP Manager	HBPM	2 / 4 / 8		
Task Leader	HBTL	1 / 4 / 32	Group 1	4
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	1 / 1 / 2		
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	1 / 1 / 4	Group 1	1
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	5 / 4 / 160	Group 1	40
Bartlett Maint Specialist	HRDS	1 / 1 / 2	Group 1	1
Bartlett Health Physics	HRH	2 / 4 / 64	Group 1	8
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: N/A

Special Equipment/Material: N/A

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? Twenty years experience in planning and conduct of government and industrial R&D projects at Battelle

What experience is directly related to BCLDP? Eight years of direct BCLDP experience planning and managing Remedial Action activities including material & utility removal, decontamination, excavation and drain removal, and asbestos abatement

Did we apply a complexity factor during our thought process? No. Activity comparable to similar tasks performed at KA campus.

Completed by: D. A. Seifert **Date:** 4/28/02 **Rev. No.:** 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I017

Work Pkg. No.: 7I4-B05

Function Name: Perform JN-6 Guardhouse & Emergency Generator Decon Completion Survey

Component Name: JN-6 Guard House

Function Description: Baseline Characterization of the JN-6 Guard House

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; TD-AP-2.0

Input Descriptions:

1. Rooms and Areas that have undergone material and M&E removal & decontamination

Output Descriptions: data to report generation

Assumptions:

1. 5% of all monitored areas were contaminated
 2. 100% of all floor area were surveyed.
 3. 100% of all wall area up to 2m were surveyed.
 4. 120% of all ceilings were surveyed (20% added for horizontal surfaces)
 5. 10% or 30sq. meters whichever is larger of wall areas greater than 2m were monitored
 6. All of exterior surveyed (10% or 30 grid rule)
 7. Final Status Survey ---Guard House remains intact
 8. Normal rate for characterization surveys is 6 square meters per technician-hour
 9. Ladder rate for characterization surveys is 5 square meters per technician-hour
 10. Lift rate for characterization surveys is 4 square meters per technician-hour
 11. The rate for characterization surveys includes: 5cm/sec survey rate, documentation, assess elevated levels>DLV, alpha, alpha + beta 2min counts required, perform smears.
 12. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
 13. WI under FY 2001 activity E004
 14. No significant down time
1. **Estimated Time to Plan the Work (Including Review and Approval):** 0 days; WI under FY 2001 activity E004

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	NA
Technical Advisors	HBTA	NA
Project Manager/HP Manager	HBPM	NA
Task Leader	HBTL	NA
Secretary/Clerical	HBS	NA
Support Professional	HBP	NA
Bartlett Health Physics	HRH	NA

Estimated Time to Perform the Work: 3 work day for decon survey

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/3/6	NA	NA
Technical Advisors (Safety)	HBTA	1/3/3	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/3/12	0	3
Battelle Technician (HP)	HBT	1/3/24	0	3
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH	3/3/64	0	18
(Instruments)		1/3/2	NA	NA
(Data)		1/3/24	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor applied?

No, work similar to KA

Completed by: J. F. POLIZIANI

Date: 5/16/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I018

Work Pkg. No.: 7I4-B01

Function Name: Remove New Access Control Point Trailer

Component Name: Access Control Trailer

Function Description: Remove the Access Control Trailer from West Side of the JN-1 facility.

Basis of Estimate

Strategy for Accomplishing Function: The Access Control Trailer will be released and returned to leasor. The ground around the Access Control Trailer will fall into the general survey grid and released along with the surrounding grounds.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04; HS-AP-2.0, 4.0, 5.0; HS-OP-001; HP-AP-1.0, 2.0, 5.0; HP-OP-011, 012, 019; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; SM-OP-001; TD-AP-2.0, 3.0

Input Descriptions:

- No longer a site need for the Access Control Trailer.
- Material, waste and non-structural materials as described in Waste volumes & types FY 2001 and a physical walk down of the building

Output Descriptions:

Free Released Waste/material	2200 cu ft
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Assumptions:

1. The Access Control Trailer can be removed when there is no longer a need for a support facility.
2. This trailer is new and can be free released.

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	2/2/4
Technical Advisors	HBTA	2/1/8
Project Manager/HP Manager	HBPM	2/5/20
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/1/8
Bartlett Health Physics	HRH	1/1/4

Estimated Time to Perform the Work: 10 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 10 / 10		
Project Manager/HP Manager	HBPM	2 / 10 / 20		
Task Leader	HBTL	1 / 10 / 20		
Battelle Technician	HBT	1 / 10 / 10		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	1 / 10 / 20		
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	1 / 10 / 80		
Bartlett Maint Specialist	HRDS	1 / 10 / 10		
Bartlett Health Physics	HRH	2 / 10 / 160		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 15 years experience in operational planning and execution in both private industry and DOE projects.

What experience is directly related to BCLDP? 5 years of direct experience in D&D of nuclear facilities within the DOE complex.

Did we apply a complexity factor during our thought process? The estimate was based on prior experience conducting similar work on the BCLDP. No complexity factor was used.

Completed by: P. Weaver

Date: 5/10/01

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I019

Work Pkg. No.: 7I4-B01

Function Name: Remove Sea/Lands

Component Name: Sea/land Vans Storage

Function Description: Remove the Sea/land Vans Storage from the West Jefferson North Facility.

Basis of Estimate

Strategy for Accomplishing Function: The Sea/land Vans Storage units will be free released for reuse.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04; HS-AP-2.0, 4.0, 5.0; HS-OP-001; HP-AP-1.0, 2.0, 5.0; HP-OP-011, 012, 019; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020

Input Descriptions:

- No longer a site need for the Sea/land Vans Storage Units.
- Material, waste and non-structural materials as described in Waste volumes & types FY 2001 and a physical walk down of the building

Output Descriptions:

Free Released Material	14000 cu ft
LLW Non Compactable (Envirocare)	1000 cu ft

Assumptions:

- The Sea/land Vans Storage will be free released.
- Contents will be released, disposed of or sent to other DOE sites for contaminated/clean reuse.

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	2/2/4
Technical Advisors	HBTA	2/1/8
Project Manager/HP Manager	HBPM	2/5/20
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/1/8
Bartlett Health Physics	HRH	1/1/4

Estimated Time to Perform the Work: 40 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 40 / 40		
Project Manager/HP Manager	HBPM	2 / 40 / 80		
Task Leader	HBTL	1 / 40 / 80		
Battelle Technician	HBT	1 / 40 / 40		
Battelle Technician O/T	HBTO			
RAL Staff	HLB			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	3 / 40 / 960		
Bartlett Maint Specialist	HRDS	1 / 40 / 40		
Bartlett Health Physics	HRH	2 / 40 / 640		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material:

Comments/Explanations: : This work will be performed on a staff available basis and will be accomplished over one year.

Basis of Estimate:

What is the estimator's experience? 15 years experience in operational planning and execution in both private industry and DOE projects.

What experience is directly related to BCLDP? 5 years of direct experience in D&D of nuclear facilities within the DOE complex.

Did we apply a complexity factor during our thought process? The estimate was based on prior experience conducting similar work on the BCLDP. No complexity factor was used.

Completed by: P. Weaver

Date: 5/10/01

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I020

Work Pkg. No.: 7I4-B01

Function Name: Remove Temporary Transformer

Component Name: JN-1 Transformer

Function Description: Remove the JN-1 Transformer from the West Jefferson North Facility.

Basis of Estimate

Strategy for Accomplishing Function: The JN-1 Transformer will be free released and removed to a new location on Battelle property or disposed of as clean waste. The ground around and under the transformer will fall into the general survey grid and be released along with the surrounding grounds.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04; DD-OP-090; HS-AP-2.0, 4.0, 5.0; HS-OP-001; HP-AP-1.0, 2.0, 5.0; HP-OP-011, 012, 019; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; SIH-PP-04; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020

Input Descriptions:

- No longer a JN-1 facility site need for power.
- Material, waste and non-structural materials as described in Waste volumes & types FY 2001 and a physical walk down of the building

Output Descriptions:

LLW Non-compactable (Envirocare)	90 cu ft
Free Released Material (transformer)	1000 cu ft

Assumptions: The Electric Substation can be removed when the need for back power no longer exists.

- A total of 4 gamma spec and 1 alpha isotopic samples will be taken.
- Waste will have PCB screening.
- The concrete pad and soil are not radiologically contaminated although it is possible the soil under and around it is.

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	2/2/4
Technical Advisors	HBTA	2/1/8
Project Manager/HP Manager	HBPM	2/5/20
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/1/8
Bartlett Health Physics	HRH	1/1/4

Estimated Time to Perform the Work: 5 days

Activity Number: I020

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 5 / 6		
Project Manager/HP Manager	HBPM	2 / 5 / 10		
Task Leader	HBTL	1 / 5 / 15		
Battelle Technician	HBT	1 / 5 / 5		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	2 / 5 / 20		
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF	1 / 5 / 10		
Bartlett Technician	HRD	2 / 5 / 80		
Bartlett Maint Specialist	HRDS	1 / 5 / 5		
Bartlett Health Physics	HRH	1 / 5 / 40		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 15 years experience in operational planning and execution in both private industry and DOE projects.

What experience is directly related to BCLDP? 5 years of direct experience in D&D of nuclear facilities within the DOE complex.

Did we apply a complexity factor during our thought process? The estimate was based on prior experience conducting similar work on the BCLDP. No complexity factor was used.

Completed by: P. Weaver

Date: 5/10/01

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I021

Work Pkg. No.: 7I4-B01

Function Name: Remove Breathing Air System behind JN-1

Component Name: JN-1 Breathing Air System

Function Description: Remove JN-1 Breathing Air System from the West Jefferson North Facility.

Basis of Estimate

Strategy for Accomplishing Function: The JN-1 Breathing Air System I94058 will be free released and removed to a new location or government surplus/reuseable equipment. The ground around the JN-1 Breathing Air System will be completed in the apron removal.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04; HS-AP-2.0, 4.0, 5.0; HS-OP-001; HP-AP-1.0, 2.0, 5.0; HP-OP-011, 012, 019; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; SIH-PP-04; SM-OP-001; TD-AP-2.0, 3.0

Input Descriptions:

- No longer a JN-1 facility site need for JN-1 Breathing Air System
- Material, waste and non-structural materials as described in Waste volumes & types FY 2001 and a physical walk down of the building

Output Descriptions:

Free Released Material	500 cu ft
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Assumptions: The JN-1 Breathing Air System can be removed when the need for breathing air no longer exists.

- The asphalt is suspected to be radiologically contaminated and part of the JN-1 Apron.
- The lean-to covering the breathing air system can be free released.

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	2/2/4
Technical Advisors	HBTA	2/1/8
Project Manager/HP Manager	HBPM	2/5/20
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/1/8
Bartlett Health Physics	HRH	1/1/4

Estimated Time to Perform the Work: 5 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 5 / 6		
Project Manager/HP Manager	HBPM	2 / 5 / 10		
Task Leader	HBTL	1 / 5 / 15		
Battelle Technician	HBT	1 / 5 / 5		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	2 / 5 / 20		
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	2 / 5 / 80		
Bartlett Maint Specialist	HRDS	1 / 5 / 5		
Bartlett Health Physics	HRH	1 / 5 / 40		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 15 years experience in operational planning and execution in both private industry and DOE projects.

What experience is directly related to BCLDP? 5 years of direct experience in D&D of nuclear facilities within the DOE complex.

Did we apply a complexity factor during our thought process? The estimate was based on prior experience conducting similar work on the BCLDP. No complexity factor was used.

Completed by: P. Weaver

Date: 5/10/01

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I023

Work Pkg. No.: 7I4-B01

Function Name: Remove JN-1 Boneyard

Component Name: JN-1 Boneyard

Function Description: Remove the JN-1 Boneyard from the West Jefferson North Facility.

Basis of Estimate

Strategy for Accomplishing Function: The JN-1 Boneyard material will be free released and disposed of as clean waste.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04; HS-AP-2.0, 4.0, 5.0; HS-OP-001; HP-AP-1.0, 2.0, 5.0; HP-OP-011, 012, 019; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020

Input Descriptions:

- No longer a site need for the material.
- Material, waste and non-structural materials as described in Waste volumes & types FY 2001 and a physical walk down of the building.

Output Descriptions:

Free Released Material	12,800 cu ft
LLW Non Compactable (Envirocare)	100 cu ft

Assumptions:

- This Material is clean and will no longer needed.
- This activity could be performed over a year.

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	2/2/4
Technical Advisors	HBTA	2/1/8
Project Manager/HP Manager	HBPM	2/5/20
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/1/8
Bartlett Health Physics	HRH	1/1/4

Estimated Time to Perform the Work: 40 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTB	1 / 40 / 40		
Project Manager/HP Manager	HBPM	2 / 40 / 80		
Task Leader	HBTB	1 / 40 / 80		
Battelle Technician	HBT	1 / 40 / 40		
Battelle Technician O/T	HBTB			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	2 / 40 / 480		
Bartlett Maint Specialist	HRDS	1 / 40 / 40		
Bartlett Health Physics	HRH	2 / 40 / 480		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material:

Comments/Explanations: This work will be performed on a staff available basis and will be accomplished over one year.

Basis of Estimate:

What is the estimator's experience? 15 years experience in operational planning and execution in both private industry and DOE projects.

What experience is directly related to BCLDP? 5 years of direct experience in D&D of nuclear facilities within the DOE complex.

Did we apply a complexity factor during our thought process? The estimate was based on prior experience conducting similar work on the BCLDP. No complexity factor was used.

Completed by: P. Weaver

Date: 5/10/01

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I025

Work Pkg. No.: 7I4-B02

Function Name: Remove JN-1 Sheep Shed

Component Name: Sheep Shed

Function Description: Remove the Sheep Shed from West side of the JN-1 facility.

Basis of Estimate

Strategy for Accomplishing Function: The Sheep Shed will be disposed of as radioactive waste. The ground under and around the Sheep Shed will fall into the general survey grid and be released along with the surrounding grounds.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04; HS-AP-2.0, 4.0, 5.0; HS-OP-001; HP-AP-1.0, 2.0, 5.0; HP-OP-011, 012, 019; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020

Input Descriptions:

- No longer a site need for the Sheep Shed
- Material, waste and non-structural materials as described in Waste volumes & types FY 2001 and a physical walk down of the building

Output Descriptions:

LLW Non-compactable (Envirocare)	500 cu ft
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Assumptions:

- The Sheep Shed can be removed when there is no longer a need for a support facility.
- All waste containers will be removed from inside and are not a part of the waste volume of this sheet.
- The floor will be removed with the JN-1 apron.

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	2/2/4
Technical Advisors	HBTA	2/1/8
Project Manager/HP Manager	HBPM	2/5/20
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/1/8
Bartlett Health Physics	HRH	1/1/4

Estimated Time to Perform the Work: 10 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 10 / 10		
Project Manager/HP Manager	HBPM	2 / 10 / 20		
Task Leader	HBTL	1 / 10 / 20		
Battelle Technician	HBT	1 / 10 / 10		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	2 / 10 / 160		
Bartlett Maint Specialist	HRDS	1 / 10 / 10		
Bartlett Health Physics	HRH	1 / 10 / 80		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 15 years experience in operational planning and execution in both private industry and DOE projects.

What experience is directly related to BCLDP? 5 years of direct experience in D&D of nuclear facilities within the DOE complex.

Did we apply a complexity factor during our thought process? The estimate was based on prior experience conducting similar work on the BCLDP. No complexity factor was used.

Completed by: P. Weaver

Date: 5/10/01

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I026

Work Pkg. No.: 7I4-B02

Function Name: Remove Storage Trailer by Break Trailer

Component Name: Storage Trailer JNT-2

Function Description: Remove the Storage Trailer from West side of the JN-1 facility.

Basis of Estimate

Strategy for Accomplishing Function: The Storage Trailer will be disposed of as radioactive waste and free released waste. The ground around the Storage Trailer will fall into the general survey grid and released along with the surrounding grounds.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04; HS-AP-2.0, 4.0, 5.0; HS-OP-001; HP-AP-1.0, 2.0, 5.0; HP-OP-011, 012, 019; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020

Input Descriptions:

- No longer a site need for the Storage Trailer.
- Material, waste and non-structural materials as described in Waste volumes & types FY 2001 and a physical walk down of the building

Output Descriptions:

LLW Non-compactable (Envirocare)	800 cu ft
Free Released Waste/Material	500 cu ft

Assumptions:

- The Storage Trailer can be removed when there is no longer a need for a support facility.
- The frame, contents, and windows can be free released during removal.
- This trailer has had rodents in it that could have contaminated the inner walls and floor with low levels of contamination

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	2/2/4
Technical Advisors	HBTA	2/1/8
Project Manager/HP Manager	HBPM	2/5/20
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/1/8
Bartlett Health Physics	HRH	1/1/4

Estimated Time to Perform the Work: 25 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 25 / 25		
Project Manager/HP Manager	HBPM	2 / 25 / 50		
Task Leader	HBTL	1 / 25 / 50		
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	2 / 5 / 40		
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	3 / 25 / 500		
Bartlett Maint Specialist	HRDS	1 / 25 / 25		
Bartlett Health Physics	HRH	1 / 25 / 200		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: N/A

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 15 years experience in operational planning and execution in both private industry and DOE projects.

What experience is directly related to BCLDP? 5 years of direct experience in D&D of nuclear facilities within the DOE complex.

Did we apply a complexity factor during our thought process? The estimate was based on prior experience conducting similar work on the BCLDP. No complexity factor was used.

Completed by: P. Weaver

Date: 5/10/01

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I027

Work Pkg. No.: 7I4-B06

Function Name: Survey and Release Old Guard House

Component Name: Old Guard House

Function Description: Free release the Old Guard House located on the east side of the JN-2 facility.

Basis of Estimate

Strategy for Accomplishing Function: The Old Guard House will be surveyed to verify no radioactive contamination is present and free released in place. Any localized contamination will be removed without tearing down the structure. The ground around and under the Old Guard House will fall into the general survey grid and released along with the surrounding grounds.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04; HS-AP-2.0, 4.0, 5.0; HS-OP-001; HP-AP-1.0, 2.0, 5.0; HP-OP-011, 012, 019; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020

Input Descriptions:

- No longer needed for storage or to house gas gnode.
- Material, waste and non-structural materials as described in Waste volumes & types FY 2001 and a physical walk down of the building

Output Descriptions:

LLW Non-compactable (Envirocare)	20 cu ft
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Assumptions:

- The Old Guard House can be free released and will not be used for any further activities such as storage.
- The Old Guard House might have some waste that will be disposed of a LLW due to inaccessible surfaces or areas that rodents could have contaminated.

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	2/2/4
Technical Advisors	HBTA	2/1/8
Project Manager/HP Manager	HBPM	2/5/20
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/1/8
Bartlett Health Physics	HRH	1/1/4

Estimated Time to Perform the Work: 10 days

Activity Number: I027.

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 *Group 1 160*

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 10 / 10		
Project Manager/HP Manager	HBPM	2 / 10 / 10		
Task Leader	HBTL	1 / 10 / 10		
Battelle Technician	HBT	1 / 10 / 10		
Battelle Technician O/T	HBT0			
RAL Staff	HL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	1 / 1 / 8		
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	2 / 5 / 80		
Bartlett Maint Specialist	HRDS	1 / 10 / 20		
Bartlett Health Physics	HRH	2 / 10 / 120		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 15 years experience in operational planning and execution in both private industry and DOE projects.

What experience is directly related to BCLDP? 5 years of direct experience in D&D of nuclear facilities within the DOE complex.

Did we apply a complexity factor during our thought process? The estimate was based on prior experience conducting similar work on the BCLDP. No complexity factor was used.

Completed by: P. Weaver

Date: 5/31/01

Rev. No.: 1

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I035

Work Pkg. No.: 7I4-B02

Function Name: Remove Dosimetry Trailer

Component Name: Dosimetry Trailer

Function Description: Remove the Dosimetry Trailer JNT-1 from West side of the JN-1 facility.

Basis of Estimate

Strategy for Accomplishing Function: The Dosimetry Trailer will be disposed of as radioactive waste and free released waste. The ground around the Dosimetry Trailer will fall into the general survey grid and released along with the surrounding grounds.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04; HS-AP-2.0, 4.0, 5.0; HS-OP-001; HP-AP-1.0, 2.0, 5.0; HP-OP-011, 012, 019; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020

Input Descriptions:

- No longer a site need for the Dosimetry Trailer.
- Material, waste and non-structural materials as described in Waste volumes & types FY 2001 and a physical walk down of the building.

Output Descriptions:

LLW Non-compactable (Envirocare)	500 cu ft
Free Released Waste/Material	300 cu ft

Assumptions:

- The Dosimetry Trailer I87358 can be removed when there is no longer a need for a support facility.
- The frame, contents, and windows can be free released during removal.
- This trailer has had rodents in it that could have contaminated the inner walls and floor with low levels of contamination.

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	2/2/4
Technical Advisors	HBTA	2/1/8
Project Manager/HP Manager	HBPM	2/5/20
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/1/8
Bartlett Health Physics	HRH	1/1/4

Estimated Time to Perform the Work: 20 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBT	1 / 20 / 20		
Project Manager/HP Manager	HBPM	2 / 20 / 40		
Task Leader	HBT	1 / 20 / 40		
Battelle Technician	HBT			
Battelle Technician O/T	HBT			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBS			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	1 / 5 / 40		
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	3 / 20 / 400		
Bartlett Maint Specialist	HRDS	1 / 20 / 20		
Bartlett Health Physics	HRH	1 / 20 / 160		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 15 years experience in operational planning and execution in both private industry and DOE projects.

What experience is directly related to BCLDP? 5 years of direct experience in D&D of nuclear facilities within the DOE complex.

Did we apply a complexity factor during our thought process? The estimate was based on prior experience conducting similar work on the BCLDP. No complexity factor was used.

Completed by: P. Weaver

Date: 5/10/01

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I043

Work Pkg. No.: 7I4-B08

Function Name: Remediate Abandoned North Filter Bed Areas-(*Baseline Case*)

Component Name: West Jeff External Areas

Function Description: Remediation of radioactively contaminated soil in the area of the Abandoned North Filter Beds. See Utilocate Drawing (at BCLDP request) Diagram dated 3/00; E.C. Babbert Inc. Construction Drawings, Sheets 1-7, dated 11/18/85; Burgess and Niple Plan Drawing Job No. 3795, Dated 1985, Sheet 1 of 2; Burgess & Niple Drawings H4, J4, H5, J5 dated September '79; BCLDP Characterization Results Sept-Nov 2000; BCLDP Characterization E-mail of 5/17/02

Basis of Estimate

Strategy for Accomplishing Function

Mechanical removal of soil through use of an excavator and qualified operator. HP and Characterization Personnel will assist in screening soil to confirm expected contamination levels and provide worker protection. A trench box will be mobilized and available for use also in accessing the excavated area. Current plans are for waste containers to be mechanically transported up the gravel road and staged/loaded into waste disposal and transportation vehicles. Drain processing and waste disposal costs are not accounted for here. The waste processing steps will take place quick enough to keep pace with the removal operations and a significant backlog of waste soil bags will not be accumulated. Two crews are planned to be used for soil removal

The active drain line running from the north filter bed area will be rerouted around the filter bed area.

The deactivated drain line in the area is assumed to be contaminated and will be removed.

Some soil is assumed to be contaminated under the drain line and will be removed.

Internal and external (IVC) final status sampling will take place in each area. Cost for this is not included here, but a duration is.

The area will then be backfilled, graded, seeded, and mulched.

Uncontaminated waste will be disposed of similar to the process for the contaminated waste or staged in the area for backfill use.

Applicable Requirements/Procedures:

BCLDP Volumetric Release Criteria; NRC Decommissioning Plan; ALARA Program; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-3.2, 4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020, 036

Input Descriptions:

1. Radiological characterization data of the entire area.
2. Equipment and qualified personnel resources ready to support the operations.

Output Descriptions:

1. Completed Work Instruction Data Package
2. Contaminated soil=93,621 cf
3. Contaminated drain line =575 LF of drain line
4. 347 gamma spec samples, 35 alpha samples
5. Job Control Waste volume=331 cf
6. Fully restored, graded, seeded, and mulched site.

Assumptions:

1. Soil volumes based on quadrant locations and sampling results as presented in BCLDP Characterization e-mail of 5/17/02
2. 10% of area under drain lines will be contaminated in a 3ft x 3ft area
3. No hazardous substances beside radiological contamination will be encountered.
4. No components of the two abandoned north filter beds will be encountered, only soil will need to be removed.
5. Recent utility surveys performed for characterization activities are adequate for remediation as well and no other utilities will be found in the work area.
6. Work can be performed without any special regulatory requirements due to proximity of the Big Darby Creek
7. Weather and ground water levels will not significantly affect the operations
8. IVC will be on-site or accept BCLDP final status results so backfilling can take place immediately upon receipt of BCLDP final status sample results/
9. Production rates will be as follows: Soil removal-1296 cf/day/crew x 2 crews/day=2592 cf/day; Rerouting active drain (398 LF)-39 LF/day; Drain line Removal (575LF)-20LF/day; Backfill - 21,600cf/day/crew x 2 crews/day=43,200 cf/day; Final Status Survey and IVC-10 days

Estimated Time to Plan the Work (Including Review and Approval): 17 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

None. Included under corresponding planning function.

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1/1/4*
Technical Advisors	HBTA	1/17/17
Project Manager/HP Manager	HBPM	2/17/56 1/1/4*
Task Leader	HBTL	1/17/56
Secretary/Clerical	HBS	
Support Professional	HBP	1/17/14
Bartlett Health Physics	HRH	1/5/5

* Additional review time for Level 2 hazard rating.

Estimated Time to Perform the Work: 87 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/77/92	N/A	
Project Manager/HP Manager	HBPM	2/87/206	N/A	
Task Leader	HBTL	1/87/466	0	87
Battelle Technician	HBT	1/39/105	0	39
Battelle Technician O/T	HBTO			

RAL Staff	HBL			
Support Professional	HBP	1/77/62	N/A	
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	10/75/3415	0	750
Bartlett Maint Specialist	HRDS	1/75/120	0	75
Bartlett Health Physics	HRH	5/75/2216	0	374
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Excavation Subcontractor Operator = 886 hrs @ \$47.59/hr=\$42,165
- PC200 Excavator Rental = 111 machine days @ \$4,780/mo.=\$28,187
- Skid Loader Rental = 111 machine days @ \$2,644/mo.=\$15,970
- Trench Box Rental = 111 machine days @ \$1,058/mo.=\$6,454
- Backfilling/Grading/Seeding = 3448 cy @ \$71.38/cy=\$246,118

Special Equipment/Material:

Comments/Explanations:

1. Drainlines will be shut off and isolated so they can be removed mechanically and by hand. Drainlines running from the active North Filter Bed will be rerouted.
2. The oil and gas line depth is 12 feet, is abandoned, and will not be removed or otherwise affected by the remediation work.
3. Intermittent water may be encountered in the excavation, however it will be allowed to dissipate back into the surrounding soil, removed and processed with the contaminated soil (drying agent added), or pumped into 55-gallon drums that will be sampled and free released. This will be an insignificant impact on the operation and waste volumes due to planned measures (protective coverings, weather forecasts, quick IVC release and backfilling) to address this issue.

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks

Did we apply a complexity factor during our thought process? Yes, production rates & crew size were based on previous external excavation efforts, but were adjusted to account for known contamination levels of the soil and transporting the soil waste a significant distance (up the hill) to a disposal container.

Completed by: Scott R. Brown

Date: 5/28/2002

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I044

Work Pkg. No.: 7I4-B09

Function Name: Perform Abandoned North Filter Beds Completion Survey

Component Name: Abandoned North Filter Bed

Function Description: Abandoned North Filterbed Completion Survey

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; RL-AP-1.0; QD-AP-4.1, 5.2, 6.1, 7.1; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal

Output Descriptions:

1. 175 gamma spectrum and 17 alpha isotopic samples
2. Data to report generation

Assumptions:

1. 100% of area will be surveyed.
2. Normal rate for walkover characterization surveys is 200 square meters per technician-hour
3. Bed Area N is 2 100 sq. m grids==45'x 25'x 6'==# samples=2x4x2=16 smpls; 1m;
4. Bed Area S is 4 100 sq. m grids==60' x40 x14'==# samples=4x4x2=32 smpls; 1m;
5. Bed Soil Samples 16 samples/d; 24 locations;48 smpls; 3d to sample
6. 5 % of total # exceeds DLV =0.05 x 48 = 3 to lab
7. 51 Bed Samples to Lab
8. Highest Depth Sample per Adjacent grid Bed N is (4) x10 grids = 40s to lab; 160 samples; 10d to samp.
9. Highest Depth Sample per Adjacent grid Bed S is 7x12 grids=84 s to lab; 336 samples total; 21d samp.
10. 175 samples to lab total
11. The rate for characterization surveys includes: 5cm/sec survey rate, documentation, assess elevated levels>DLV, alpha,alpha+beta 2min counts required, perform smears.
12. 1 d for walkover survey
13. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
14. WI takes 24 hr to prepare/Safety Prof. 8hr for WI/SCL/6 Prof @ 2 hr For Rev/ Appr.
15. Initial Instrument Calibration 8hrs +10% time
16. No significant down time
17. Line Location 2 techs -2 days;1 tech 2 days to document; BCO Utilities 2 techs - 2 days to rev/appr

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 5 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	3/4/32
Technical Advisors	HBTA	3/3/20
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	1/1/8
Support Professional (Line Loc)	HBP	4/5/80
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 34 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/34/68	NA	NA
Technical Advisors (Safety)	HBTA	1/34/34	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/34/36	0	34
Battelle Technician (HP)	HBT	1/34/272	0	34
Battelle Technician O/T	HBTO			
RAL Staff	HL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	1/25/8		
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/34/816	0	138
(Data)		1/34/35	NA	NA
		1/34/272	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate**What is the estimator's experience?**

15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience. 2 years at West Jefferson

Was a complexity factor used?

No, work is similar to that performed at KA

Completed by: J.F. POLIZIANI

Date: 5/18/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I046

Work Pkg. No.: 7I4-B10

Function Name: Remediate Abandoned Middle Filter Bed

Component Name: Abandoned Middle Filter Bed

Function Description: Remediation of radioactively contaminated soil and old abandoned waste treatment components in the area of the Old Middle Area Filter bed. See Utilocate Drawing (at BCLDP request) Diagram dated 3/00; Burgess & Niple Site Plan, Sheets 1-4, dated June 1979; Burgess and Niple Plan Drawing Job No. 3795, Dated 1985, Sheet 1 of 2; Burgess & Niple Drawings H4, J4, H5, J5 dated September '79; BCLDP Characterization E-mail of 5/17/02

Basis of Estimate

Strategy for Accomplishing Function:

Mechanical removal of soil through use of an excavator and qualified operator. HP and Characterization Personnel will assist in screening soil to confirm expected contamination levels and provide worker protection. A trench box will be mobilized and available for use also in accessing the excavated area. Current plans are for waste containers to be mechanically transported up the gravel road and staged/loaded into waste disposal and transportation vehicles. Drain processing and waste disposal costs are not accounted for here. The waste processing steps will take place quick enough to keep pace with the removal operations and a significant backlog of waste soil bags will not be accumulated. One crew is planned to be used for soil removal

The deactivated drain line in the area is assumed to be contaminated and will be removed.

Some soil is assumed to be contaminated under the drain line and will be removed.

Internal and external (IVC) final status sampling will take place in each area. Cost for this is not included here, but a duration is.

The area will then be backfilled, graded, seeded, and mulched.

Uncontaminated waste will be disposed of similar to the process for the contaminated waste or staged in the area for backfill use.

Applicable Requirements/Procedures:

BCLDP Volumetric Release Criteria; NRC Decommissioning Plan; ALARA Program; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-97-02; DD-CP-002; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-3.2, 4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020, 036

Input Descriptions:

1. Radiological characterization data of the entire area.
2. Equipment and qualified personnel resources ready to support the operations.

Output Descriptions:

1. Completed Work Instruction Data Package
2. Contaminated soil (and old treatment plant components)= 5099 cu ft
3. Contaminated drainline=273 LF
4. 19 gamma spec samples and 2 alpha samples
5. Job Control Waste volume=54 ft³
6. Fully restored, graded, seeded, and mulched site.

Assumptions:

1. Soil volumes based on quadrant locations and sampling results as presented in BCLDP Characterization e-mail of 5/17/02
2. 10% of area under drain lines will be removed in a 3 ft x 3 ft area.
3. No hazardous soil beside radiological contamination will be encountered.
4. Recent utility surveys performed for characterization activities are adequate for remediation as well and no other utilities will be found in the work area.
5. Work can be performed without any special regulatory requirements due to proximity of the Big Darby Creek
6. Weather and ground water levels will not significantly affect the operations
7. IVC will be on-site or accept BCLDP final status results so backfilling can take place immediately upon receipt of BCLDP final status sample results.
8. Production rates will be as follows: Soil removal-972 cf/day/crew=5 days; Drain line Removal (273 lf) - 20lf/day =14 days; Backfill 21,600cf/day/crew = <1 day; Final Status Survey and IVC - 10 days.

Estimated Time to Plan the Work (Including Review and Approval): 20 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1/1/4*
Technical Advisors	HBTA	1/20/24
Project Manager/HP Manager	HBPM	2/20/64 1/1/4*
Task Leader	HBTL	1/20/64
Secretary/Clerical	HBS	
Support Professional	HBP	1/20/16
Bartlett Health Physics	HRH	

* Additional review time for Level 2 hazard rating.

Estimated Time to Perform the Work: 29 Days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/19/23	N/A	
Project Manager/HP Manager	HBPM	2/29/69	N/A	
Task Leader	HBTL	1/29/124	0	29
Battelle Technician	HBT	1/14/11	0	14
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	1/19/15	N/A	
Secretary/Clerical	HBS			

Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	5/19/418	0	95
Bartlett Maint Specialist	HRDS	1/19/30	0	19
Bartlett Health Physics	HRH	3/19/374	0	57
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Excavation Subcontractor Operator = 149 hrs @ \$47.59/hr =\$7,091
- PC200 Excavator Rental = 19 machine days @ \$4,780/mo.=\$4,992
- John Deere 410 Skid Loader Rental = 19 machine days @ \$2,500/mo.=\$2,712
- Trench Box Rental = 19 machine days @ \$1,058/mo.=\$1,270
- Backfilling/Grading/Seeding = 191 cy @ \$71.38/cy=\$13,634

Special Equipment/Material:

Comments/Explanations:

1. Drainlines will be shut off and isolated so they can be removed mechanically and by hand. Drainlines running from the active North Filter Bed will be rerouted under a different function.
2. The oil and gas line depth is 12 feet, is abandoned, and will not be removed or otherwise affected by the remediation work.
3. Intermittent water may be encountered in the excavation, however it will be allowed to dissipate back into the surrounding soil, removed and processed with the contaminated soil (drying agent added), or pumped into 55-gallon drums that will be sampled and free released. This will be an insignificant impact on the operation and waste volumes due to planned measures (protective coverings, weather forecasts, quick IVC release and backfilling) to address this issue.

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks

Did we apply a complexity factor during our thought process? Yes, production rates & crew size were based on external excavation efforts in the abandoned north filter bed activity (I043), but were reduced by 25% to account for the presence of old treatment plant components containing concrete and other materials more difficult to remove than soil.

Completed by: Scott R. Brown (rvw'd by DAS)

Date: 5/28/2002

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I047

Work Pkg. No.: 7I4-B11

Function Name: Perform Old Middle Filter Bed Completion Survey

Component Name: Old Middle Filter Bed

Function Description: Old Middle Filterbed Completion Survey

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; RL-AP-1.0; QD-AP-4.1, 5.2, 6.1, 7.1; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal

Output Descriptions:

1. 116 gamma spectrum and 11 alpha isotopic samples
2. Data to report generation

Assumptions:

1. 100% of area will be surveyed.
2. Normal rate for walkover characterization surveys is 200 square meters per technician-hour
3. Bed Area is 4 100 sq. m grids==60' x40 x14'==# samples=4x4x2=32 smpls; 1m;
4. Bed Soil Samples 16 samples/d; 16 locations;32 smpls; 2d to sample
5. 5 % of total # exceeds DLV =0.05 x 32 = 2 to lab
6. 34 Bed Samples to Lab
7. Highest Depth Sample per Adjacent grid Bed S is 7x12 grids=84 s to lab; 336 samples total; 21d samp.
8. 116 samples to lab total
9. The rate for characterization surveys includes: 5cm/sec survey rate, documentation, assess elevated levels>DLV, alpha,alpha+beta 2min counts required, perform smears.
10. 1 d for walkover survey
11. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
12. WI under 1.4.2.2.4
13. Initial Instrument Calibration 10% time
14. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 0 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional (Line Loc)	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 24 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/24/48	NA	NA
Technical Advisors (Safety)	HBTA	1/24/24	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/24/96	0	24
Battelle Technician (HP)	HBT	1/24/192	0	24
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/24/576	0	138
(Data)		1/24/19	NA	NA
		1/24/192	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to KA experience

Completed by: J.F. POLIZIANI

Date: 5/23/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I049

Work Pkg. No.: 7I4-B15

Function Name: Remediate Active Middle Treatment System (*Baseline Case*)

Component Name: West Jeff External Areas

Function Description: Removal of radioactively contaminated soil underlying the WWTP. Placement of waste into disposal containers. See Utilocate Drawing (at BCLDP request) Diagram dated 3/00; E.C. Babbert Inc. Construction Drawings, Sheets 1-7, dated 11/18/85; Burgess and Niple Plan Drawing Job No. 3795, Dated 1985, Sheet 1 of 2; Burgess & Niple Drawings H4, J4, H5, J5 dated September '79;

Basis of Estimate

Strategy for Accomplishing Function.

- Flow will be diverted to just one side of the filter bed.
- Material inside the filter beds will be removed fully to allow access to the underlying soil and/or the structure of the filter bed will be appropriately shored/supported
- Contaminated soil will be mechanically removed through use of a small excavator (supplemented by hand as necessary) and placed into waste containers in the vicinity of the work area.
- Any human entry into the excavation area > 5 feet deep will be with a trench box for worker protection.
- Waste containers will be mechanically transported up the gravel road and staged/loaded (in the surrounding area) into waste disposal and transportation vehicles.
- Equipment will be decontaminated and other measures instituted to prevent cross-contamination.
- Soil will be field screened as it's removed and confirmatory final status samples obtained
- Upon receipt of appropriate laboratory results, the filter bed will be repaired, contents replaced, shoring/supporting systems removed, and returned to proper working condition.

Applicable Requirements/Procedures:

BCLDP Volumetric Release Criteria; NRC Decommissioning Plan; ALARA Program; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-3.2, 4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020, 036

Input Descriptions:

1. Radiological characterization data of the area under and around the filter bed.

Output Descriptions:

1. Completed Work Instruction Data Package
2. Radiological Characterization Final Status Samples and Results Verifying Acceptable Rad levels in entire area
3. Contaminated soil volume = 282 cu ft
4. RAL samples = 1 gamma spec, 1 alpha spec
5. Job Control Waste = 19 cu ft

Assumptions:

1. A 2m x 2m x 2m (8 cu m, 282cf, 10.5 cy) area of soil volume underneath the filter beds at the SE corner will be contaminated and need to be removed.
2. No hazardous substances beside radiological contamination will be encountered.
3. The filter bed contents can be treated as uncontaminated waste
4. Flow can be satisfactorily diverted to one side of the filter bed temporarily without any significant operational or regulatory effects.
5. Soil removal can be accomplished without significantly affecting the drain lines underneath and around the filter bed as well as the structural stability of the filter bed.
6. Recent utility surveys performed for characterization activities are adequate for remediation and no other utilities will be found in the work area.
7. Work can be performed without any special regulatory requirements due to proximity of the Big Darby Creek
8. Weather and ground water levels will not affect the operations
9. IVC will be on-site or accept BCLDP final status results so replacement of the filter bed material can take place immediately upon receipt of BCLDP final status sample results
10. Production rates will be as follows: Remove/Replace/Repair/Shore Filter Bed – 10 days; Contaminated Soil Removal (282 cf)-103cf/day=3 days; Final Status and IVC Release-10 days (schedule only)

Estimated Time to Plan the Work (Including Review and Approval): 20 days.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1/1/4*
Technical Advisors	HBTA	2/20/32
Project Manager/HP Manager	HBPM	2/20/64 1/1/4*
Task Leader	HBTL	1/20/64
Secretary/Clerical	HBS	1/1/5
Support Professional	HBP	1/20/16
Bartlett Health Physics	HRH	1/5/5

* Additional review time for level 2 hazard rating.

Estimated Time to Perform the Work: 23 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/23/23	N/A	
Project Manager/HP Manager	HBPM	2/23/55	N/A	
Task Leader	HBTL	1/23/40	0	13
Battelle Technician	HBT	1/23/23		

Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	1/13/10	N/A	
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Special Project	HCF	1/13/51	0	13
Bartlett Technician	HRD	3/3/65	0	9
Bartlett Maint Specialist	HRDS	1/3/4	0	3
Bartlett Health Physics	HRH	3/13/134	0	39
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Excavation Subcontractor Operator = 24 hrs @ \$47.59/hr =\$1,142
- TB070 Excavator Rental = 3 machine days @ \$158/day=\$1,322
- Skid Loader Rental = 3 machine days @ \$899/wk.=\$1,111
- Trench Box Rental = 3 machine days @ \$350/wk.=\$562
- Filter Bed Rem/Rep/Rpr = \$16,307

Special Equipment/Material:

Comments/Explanations:

1. Intermittent water may be encountered in the excavation, however it will be allowed to dissipate back into the surrounding soil, removed and processed with the contaminated soil (drying agent added), or pumped into 55-gallon drums that will be sampled and free released. This will be an insignificant impact on the operation and waste volumes due to planned measures (protective coverings, weather forecasts, quick IVC release and backfilling) to address this issue.

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks

Did we apply a complexity factor during our thought process? Yes, production rates were adjusted (lowered) some to account for difficulty of accessing soil under the WWTP, removing it, and working around the WWTP without permanently damaging its structure.

Completed by: Scott R. Brown (rvwd-DAS)

Date: 5/29/02

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I050

Work Pkg. No.: 7I4-B16

Function Name: Perform Active Middle Treatment System Bed Completion Survey

Component Name: Active Middle Bed & Treatment System

Function Description: Active Middle Bed & Treatment System

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal

Output Descriptions:

1. 175 gamma spectrum and 17 alpha isotopic samples
2. Data to report generation

Assumptions:

1. 100% of area will be surveyed.
2. Normal rate for walkover characterization surveys is 200 square meters per technician-hour
3. Bed Area 4 100 sq. m grids==60' x40 x 6'==# samples=4x4x2=32 smpls; 1m;
4. Bed Soil Samples 16 samples/d; 16 locations;32 smpls; 2d to sample
5. 5 % of total # exceeds DLV =0.05 x 32 = 2 to lab
6. 34 Bed Samples to Lab
7. Middle Bed Bounded by Abnd. N. Fltr Beds 8 grids around perimeter instead of expected 12.
8. Highest Depth Sample per Adjacent grid Bed S is 8grids x 4d/g x =32 s to lab; 128 samples total; 8d samp.
9. 128 x 0.05 exceed DLV = 7 s
10. 73 samples to lab total
11. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha,alpha+beta 2min counts required, perform smears.
12. 1 d for walkover survey
13. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
14. WI under I044
15. Instrument Calibration 10% time
16. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 0 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional (Line Loc)	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 11 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/11/22	NA	NA
Technical Advisors (Safety)	HBTA	1/11/11	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/11/44	0	11
Battelle Technician (HP)	HBT	1/11/88	0	11
Battelle Technician O/T	HBTO			
RAL Staff	HLB			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/11/264	0	66
(Data)		1/11/9	NA	NA
		1/11/88	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to KA experience

Completed by: J.F. POLIZIANI

Date: 5/23/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I052

Work Pkg. No.: 7I4-B17

Function Name: Remediate Active North Filter Bed Area

Component Name: West Jeff External Areas

Function Description: Investigation and remediation of radioactively contaminated components of the current Active North Area Waste Treatment System. See Burgess and Niple Drawings Dated June 1979, and 8/10/00; Utilocate Drawings (at BCLDP request) dated 3/00; Burgess and Niple Drawings J5, dated 9/79 and revised 12/70; Historical data packages concerning this area

Basis of Estimate

Strategy for Accomplishing Function: The following will be performed:

- The flow from the north area will be temporarily diverted to the active Middle System.
- The primary tank will be cleaned out and the interior prepared for radiological characterization. Past routine cleanout of this system ('86,'96) has indicated elevated levels of radioactivity in the contents, although the volume was free released in 1996. However, the tank interior surfaces have never been surveyed and are considered suspect.
- Mechanical removal (supplemented by hand as necessary) of contaminated drain lines, contaminated soil under the drain lines, and a small amount of contaminated soil in the general area. A trench box will be available to support entry into the excavation for supplemental hand removal and other activities.
- Periodic field screening of removed soil by characterization personnel with confirmatory laboratory analysis of samples.
- Placement of contaminated soil and drains into waste containers and transfer to BCLDP Waste Management using skidloader to move waste up the hill to processing area.
- Installation of replacement drains to allow flow to be reconnected to the filter bed
- Equipment will be decontaminated and other measures instituted to prevent cross-contamination.
- Internal and external (IVC) final status sampling will take place. Cost for this is not included here, but duration is.
- Excavated areas will then be backfilled, graded, seeded, and mulched using removed soil.

Applicable Requirements/Procedures:

BCLDP Volumetric Release Criteria; NRC Decommissioning Plan; ALARA Program; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-97-02; DD-CP-002; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-3.2, 4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020, 036

Input Descriptions:

1. Radiological characterization data of the entire area.
2. Active Middle System (or other alternative) to allow flow to be temporarily diverted

Output Descriptions:

1. Completed Work Instruction Data Package.
2. Contaminated soil = 358 cu ft
3. Contaminated drain lines = 378 LF
4. 5 gamma spec samples and 1 sample
5. Job Control Waste volume = 85 cu ft
6. Operating waste treatment facility
7. Fully restored, graded, seeded, and mulched site.

Assumptions:

1. .025% of the soil in the area (11,820 sf) will be contaminated to a depth of 6 feet (18 cf total).
2. 10% of area under drain lines will be contaminated in a 3ft x 3ft area (340 cf total)
3. No hazardous soil beside radiological contamination will be encountered
4. Alternative middle treatment system can handle diverted flow for duration of this activity
5. Recent utility surveys performed for characterization activities are adequate for remediation as well and no other utilities will be found in the work area
6. Work can be performed without any special regulatory requirements due to proximity of the Big Darby Creek
7. Weather and ground water levels will not significantly affect the operations
8. IVC will be on-site or accept BCLDP final status results so backfilling can take place immediately upon receipt of BCLDP final status sample results.
9. WWTP components will be uncontaminated and system can be put back into service
10. Removed material from primary tank can be free released and disposed of as non-rad waste.
11. Drain lines will be 5 feet deep.
12. Production rates will be as follows: Rerouting active drain above ground (380 LF)-78 LF/day=5 days; Empty and Survey Primary Tank (882cf)-145 cf/day=6days; Drain line Removal (378LF) & Cont Soil Removal (358 LF)-15LF/day=25 days; Installation of New Drain Line (378LF)-39LF/day=10 days; ; Final Status Survey and IVC-10 days

Estimated Time to Plan the Work (Including Review and Approval): 20 days including purchased service contracting.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

None. Included under corresponding planning function.

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1/1/4*
Technical Advisors	HBTA	2/20/64
Project Manager/HP Manager	HBPM	2/20/64 1/1/4*
Task Leader	HBTL	1/20/64
Secretary/Clerical	HBS	1/2/5
Support Professional	HBP	1/20/16
Bartlett Health Physics	HRH	1/5/5

* Additional review time for Level 2 hazard rating

Estimated Time to Perform the Work: 56 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
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Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/46/46	N/A	
Project Manager/HP Manager	HBPM	2/56/134	N/A	
Task Leader	HBTL	1/56/295	0	56
Battelle Technician	HBT	1/46/46	0	46
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	1/46/37	N/A	
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	2/40/636	0	80
Bartlett Maint Specialist	HRDS	1/40/64	0	40
Bartlett Health Physics	HRH	3/36/665	0	118
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Excavation Subcontractor Operator = 279 hrs @ \$47.59/hr = \$13,278
- PC200 Excavator Rental = 35 machine days @ \$4,780/mo. = \$9,772
- Skid Loader Rental = 35 machine days @ \$2,644/mo. = \$5,500
- Trench Box Rental = 50 machine days @ \$50/day = \$3,068
- Tank Cleanout = \$2,916

Comments/Explanations:

1. Drainlines will be shut off and isolated so they can be removed mechanically and by hand.
2. The oil and gas line depth is 12 feet, is abandoned, and will not be removed or otherwise affected by the remediation work.
3. Intermittent water may be encountered in the excavation, however it will be allowed to dissipate back into the surrounding soil, removed and processed with the contaminated soil (drying agent added), or pumped into 55-gallon drums that will be sampled and free released. This will be an insignificant impact on the operation and waste volumes due to planned measures (protective coverings, weather forecasts, quick IVC release and backfilling) to address this issue.

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks

Did we apply a complexity factor during our thought process? Yes, production rates were based on other external excavation efforts (primarily abandoned north filter beds), but were adjusted (lowered) some to account for working closely around an active system and backfilling drain trenches with removed soil using existing work crews.

Completed by: Scott R. Brown (rvwd DAS)

Date: 5/30/02

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I053

Work Pkg. No.: 7I4-B18

Function Name: Perform Active North Filter Bed Completion Survey

Component Name: Active North Filter Bed

Function Description: Active North Filterbed Completion Survey

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal

Output Descriptions:

1. 92 gamma spectrum and 9 alpha isotopic
2. Data to report generation

Assumptions:

1. 100% of area will be surveyed.
2. Normal rate for walkover characterization surveys is 200 square meters per technician-hour
3. Bed Area is 4 100 sq. m grids = 60' x40 x6' = # samples=4x4x2=32 smpls; 1m;
4. Bed Soil Samples 16 samples/d; 16 locations;32 smpls; 2d to sample
5. 5 % of total # exceeds DLV =0.05 x 32 = 2s to lab
6. 34 Bed Samples to Lab.
7. Highest Depth Sample per Adjacent grid Bed S is 4x12 grids=48 s to lab; 192 samples total; 12d samp.
8. 192 x 0.05 exceed DLV = 10 s
9. 92 samples to lab total
10. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha, alpha + beta 2min counts required, perform smears.
11. 1 d for walkover survey
12. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
13. WI under I044
14. Instrument Calibration 10% time
15. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 0 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional (Line Loc)	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 15 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/15/30	NA	NA
Technical Advisors (Safety)	HBTA	1/15/15	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/15/60	0	15
Battelle Technician (HP)	HBT	1/15/120	0	15
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/15/360	0	90
(Data)		1/15/12	NA	NA
		1/15/120	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to BCLDP?

10 years of BCLDP characterization & radiological release program management

Was a complexity factor applied?

No, work similar to KA experience

Completed by: J.F. POLIZIANI

Date: 5/23/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I054

Work Pkg. No.: 7I4-B19

Function Name: Locate JN-1 Back Apron Utilities

Component Name: JN-1 Back Apron

Function Description: Locate underground utilities prior to remediation

Basis of Estimate

Strategy for Accomplishing Function: Procure subcontractor to locate, map and designate utilities.

Applicable Requirements/Procedures:

Approved work instruction; Battelle site maps; HP-AP-1.0, 2.0, 5.0; HS-AP-5.0; PR-AP-17.1; QD-AP-4.1, 7.1

Input Descriptions:

1. West Jeff external areas

Output Descriptions:

1. West Jeff marked utilities.
2. Map of marked utilities

Assumptions:

1. Utilities have not previously been marked and mapped
2. Subcontractor with Battelle support will locate all applicable utilities.
3. Battelle skilled laborer is available to subcontractor for technical/facility issues.

Estimated Time to Plan the Work (Including Review and Approval): 0 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 11 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA			
Project Manager/HP Manager	HBPM	2/1/2	N/A	
Task Leader	HBTL	1/1/8	N/A	
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	1/1/2	N/A	
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	1/1/4	N/A	
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH	1/1/2	N/A	
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Utility locate subcontractor billing rate in FY2000 is \$89.89/hour. Estimate \$719.

Special Equipment/Material: Battelle maps. All other equipment supplied by subcontractor.

Comments/Explanations: Rates based on FY2000 data.

Basis of Estimate:

What is the estimator's experience? Twenty years experience in planning and conduct of government and industrial R&D projects at Battelle

What experience is directly related to BCLDP? Eight years of direct BCLDP experience planning and managing Remedial Action activities including material & utility removal, decontamination, excavation and drain removal, and asbestos abatement

Did we apply a complexity factor during our thought process? No. HP coverage required due to work in controlled area.

Completed by: D. A. Seifert

Date: 05/9/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I056

Work Pkg. No.: 7I2-B03

Function Name: Survey and Monitor JN-1 Back Apron

Component Name: JN-1 Back Apron

Function Description: Baseline Characterization of the JN-1 Back Apron

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal
2. Background levels of radiation must be low to correctly assess background

Output Descriptions:

1. Establish background radiation levels for each material
2. Establish Decision Level Values (DLVs) for each material
3. 106 gamma spectrum and 11 alpha isotopic samples
4. Data to report generation

Assumptions:

Establish Material Radiation Backgrounds & DLVs

1. 3 types of materials exist in the apron area
2. (40) 1 minute measurements for alpha + beta window per material
3. (40) 1 minute measurements for alpha window per material
4. 3 minute prep/setup/taking floor & lower wall readings (100%) = 12hrs
5. 1.25 hr to establish DLV for each material (spreadsheet)

Survey

1. 100% of area will be surveyed.
2. Normal rate for walkover characterization surveys is 200 square meters per technician-hour
3. Area is 22 100 sq. m grids=220'x 115'x 6' = # samples=22x4x4=352 smpls; 3m
4. Soil Samples 16 samples/d; 88 locations; 352 smpls; 22d to sample
5. Highest Depth Sample per grid (4) x # grids = 88 to lab
6. 5 % of total # exceeds DLV = $0.05 \times 384 = 18$ to lab
7. 106 samples to lab total
8. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha, alpha + beta 2min counts required, perform smears.
9. 1 d for walkover survey
10. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.

11. WI takes 24 hr to prepare/Safety Prof. 8hr for WI/SCL/6 Prof @ 2 hr For Rev/ Appr.
12. Initial Instrument Calibration 8hrs +10% time
13. No significant down time
14. Line Location 2 techs –2 days;1 tech 2 days to document; BCO Utilities 2 techs – 2 days to rev/appr

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 5 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	3/4/32
Technical Advisors	HBTA	3/3/20
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	1/1/8
Support Professional (Line Loc)	HBP	4/5/80
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 24 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/24/48	NA	NA
Technical Advisors (Safety)	HBTA	1/24/24	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/24/96	0	24
Battelle Technician (HP)	HBT	1/24/192	0	26
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	1/24/8		
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/24/576 1/24/28	0 NA	144 NA

(Data)		1/24/188	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years health physics and radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor applied?

No, work was similar to that performed at KA

Completed by: J.F. POLIZIANI

Date: 5/24/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I058

Work Pkg. No.: 7I4-B20

Function Name: Plan Remediation and Remediate JN-1 Back Apron (*Baseline Case*)

Component Name: West Jeff External Areas

Function Description: Remediation of radioactively contaminated soil/pavement in the area of the the JN-1 Back Apron. See BCLDP Baseline Planning Diagram dated 7/00; External Areas Baseline Waste Volume (BWV) Table, Pages 1-3, dated 6/9/00; Burgess & Niple Drawings H4, J4, H5, J5 and others dated September '79.

Basis of Estimate

Strategy for Accomplishing Function: Based on detailed characterization sampling results, radioactively contaminated soil will be removed in the subject area. This activity may take place at the same time (or close to) drainline removal (from the subject areas) and soil removal from adjacent areas is performed to maximize operational efficiency. The following activities will be performed until final status surveys indicate acceptable results:

- Installation of a sediment and excavation barrier fence.
- Mobilization of an excavator subcontractor and mechanical removal of contaminated pavement/asphalt and soil.
- Periodic field screening of removed soil by characterization/HP Personnel with confirmatory laboratory analysis of samples.
- Placement of contaminated soil into waste containers and/or directly into roll-off containers and transfer to BCLDP Waste Management
- Protection of excavation openings from environmental and other conditions

Applicable Requirements/Procedures:

BCLDP Volumetric Release Criteria; NRC Decommissioning Plan; ALARA Program; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-3.2, 4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020, 036

Input Descriptions:

1. Radiological characterization data of the entire area identifying contaminated soil areas needing to be remediated.
2. Hazardous analytical data indicating areas of mixed waste contamination
3. Rerouting or disabling of all impacted utilities
4. Equipment and qualified personnel resources ready to support the operations.

Output Descriptions:

1. Completed Work Instruction Data Package.
2. Contaminated soil. Total volume=22,000 cf
3. Mixed waste soil volume = 1000 cf
4. Samples to RAL = 85 gamma spec, 9 alpha
5. Job Control Waste volume= 64 ft³
6. Protected and covered excavation areas.

Assumptions:

1. 50 % of pavement and soil in area will be contaminated and need to be removed to a depth of 2 feet.

2. A 10 ft x 10 ft x 10 ft area around the adjacent Dilution Sump will be mixed waste.
3. Removed soil assumed to not be over contaminated drainlines needing to be removed, so soil is not "double counted" in both functions.
4. There will be no significant items remaining on the surface of the soil area to be remediated.
5. Utility surveys will have been performed for preceding characterization activities and will be adequate for remediation.
6. Any identified utilities will have been rerouted or disabled under the storm and sanitary drain relocation functions.
7. A field screening sample will be taken per cy of soil removed, with 10% of the total samples being submitted to the RAL for analysis
8. No significant subsurface structures will be encountered to slow productivity.
9. Stability of adjacent buildings is not a concern b/c they'll be demolished
10. Weather and ground water levels will not significantly affect the operations
11. Mixed waste soil volume can be removed at the same rate as radiological contaminated soil.
12. Production rates will be as follows: 23,000 cf of soil @ 674 cf/day/crew with 1 crew

Estimated Time to Plan the Work (Including Review and Approval): 20 days including purchased service contracting.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	1/20/24
Project Manager/HP Manager	HBPM	2/20/64
Task Leader	HBTL	1/20/64
Secretary/Clerical	HBS	1/2/5
Support Professional	HBP	1/20/16
Bartlett Health Physics	HRH	1/5/5

Estimated Time to Perform the Work: 34 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/34/41	N/A	
Project Manager/HP Manager	HBPM	2/34/82	N/A	
Task Leader	HBTL	1/34/205	1	34
Battelle Technician	HBT	1/34/55	1	34
Battelle Technician O/T	HBTO			
RAL Staff	HBL			

Support Professional	HBP	1/34/27		
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	2/34/546	1	68
Bartlett Maint Specialist	HRDS	1/34/55	1	34
Bartlett Health Physics	HRH	3/34/683	1	85
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Excavation Subcontractor Operator = 273 hours @ \$47.59/hour = \$12,992
- Excavator (PC120) = 34 machine days @ \$3,855/mo. = \$7,921

Special Equipment/Material:

Comments/Explanations:

1. Any impacted utilities will be shut off and isolated (due to rerouting or no need for use) and removed if they're in the path of the identified contaminated soil.
2. The oil and gas line depth is 12 feet, is abandoned, and will not be removed or otherwise affected by the remediation work.
3. Intermittent water may be encountered in the excavation, however it will be allowed to dissipate back into the surrounding soil, removed and processed with the contaminated soil (drying agent added), or pumped into 55-gallon drums that will be sampled and free released. This will be an insignificant impact on the operation and waste volumes due to planned measures (protective coverings, weather forecasts) to address this issue.
4. Backfilling of the excavation will be addressed in another function that will address all the similar excavation areas outside the filter beds.

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks

Did we apply a complexity factor during our thought process? Yes, production rates & crew size were based on similar external excavation efforts, but were adjusted down some to account for spotty location of contaminated soil, smaller area closer to buildings, and presence of mixed waste.

Completed by: Scott R. Brown (rvw'd DAS)

Date: 5/30/02

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I059

Work Pkg. No.: 7I4-B21

Function Name: Perform JN-1 Back Apron Area Completion Survey

Component Name: JN-1 Back Apron Area

Function Description: JN-1 Back Apron Area Completion Survey

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal

Output Descriptions:

1. 64 gamma spectrum and 6 alpha isotopic samples
2. Data to report generation

Assumptions:

1. 100% of area will be surveyed.
2. Normal rate for walkover characterization surveys is 200 square meters per technician-hour
3. Area is 22 100 sq. m grids=200'x 115'x 6' = # samples=22x4x4=352 smpls; 3m
4. 20% of grids affected = 4 grids
5. Soil Samples 16 samples/d; 16 locations;64 smpls; 4 d to sample
6. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha, alpha + beta 2min counts required, perform smears.
7. 1 d for walkover survey
8. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
9. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 0 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 5 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/5/10	NA	NA
Technical Advisors (Safety)	HBTA	1/5/5	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/5/20	0	5
Battelle Technician (HP)	HBT	1/5/40	0	5
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/5/120	0	30
(Data)		1/5/4	NA	NA
		1/5/40	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics experience and radiological release program management

What experience is directly related to BCLDP?

10 years of BCLDP characterization & radiological release program experience ; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to that performed at KA

Completed by: J.F. POLIZIANI

Date: 5/24/01

Rev. No.: 1

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I062

Work Pkg. No.: 7I2-B04

Function Name: Survey and Monitor JN-1 Back Controlled Area

Component Name: JN-1 Back Controlled Area

Function Description: Baseline Characterization of the JN-1 Back Controlled Area

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal
2. Background Levels of Radiation must be low to correctly assess background

Output Descriptions:

1. Established material backgrounds
2. Established material Decision Level Values (DLVs) for materials
3. 189 gamma spectrum and 19 alpha isotopic
4. Data to report generation

Assumptions:

Scan

1. 3 types of materials are present
2. (40) 1 minute measurements for alpha + beta window per material
3. (40) 1 minute measurements for alpha window per material
4. 3 minute prep/setup/taking floor & lower wall readings (100%)=12hrs
5. 1,25 hr to establish DLV for each material (spreadsheet)=4 hrs

Survey

1. 100% of area will be surveyed.
2. Normal rate for walkover characterization surveys is 200 square meters per technician-hour
3. Area is 22 100 sq. m grids=310'x 140'x 9'= # samples=41x4x3=492 smpls; 2m
4. Soil Samples 16 samples/d; 164 locations;492 smpls; 31d to sample
5. Highest Depth Sample per grid (4) x # grids = 164 to lab
6. 5 % of total # exceeds DLV =0.05 x 492 = 25 to lab
7. 189 samples to lab total
8. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha, alpha + beta 2min counts required, perform smears.
9. 1 d for walkover survey
10. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
11. Instrument Calibration 10% time
12. No significant down time

Data Technician

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 0 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional (Line Loc)	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 33 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/33/66	NA	NA
Technical Advisors (Safety)	HBTA	1/33/33	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/33/132	0	33
Battelle Technician (HP)	HBT	1/33/264	0	34
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/33/794	0	198
(Data)		1/33/28	NA	NA
		1/33/260	NA	NA
Bartlett Admin Support	HRA			

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Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics and radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to that performed at KA

Completed by: J.F. POLIZIANI

Date: 5/24/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I064

Work Pkg. No.: 7I4-B22

Function Name: Remediate JN-1 Back Control Area

Component Name: JN-1 Back Control Area

Function Description: Remediation of radioactively contaminated soil in the area of the JN-1 Back Controlled Area. See BCLDP Baseline Planning Diagram dated 7/00; External Areas Baseline Waste Volume (BWV) Table, Pages 1-3, dated 6/9/00; Burgess & Niple Drawings H4, J4, H5, J5 and others dated September '79.

Basis of Estimate

Strategy for Accomplishing Function: Based on detailed characterization sampling results, radioactively contaminated soil will be removed in the subject area. This activity may take place at the same time (or close to) drainline removal (from the subject areas) and soil removal from adjacent areas is performed to maximize operational efficiency. The following activities will be performed until final status surveys indicate acceptable results:

- Installation of a sediment and excavation barrier fence
- Mobilization of an excavator subcontractor and mechanical removal of contaminated soil supplemented by hand as necessary.
- Periodic field screening of removed soil by characterization Personnel with confirmatory laboratory analysis of samples.
- Placement of contaminated soil into waste containers and transfer to BCLDP Waste Management.
- Protection of excavation openings from environmental and other conditions.

Applicable Requirements/Procedures:

BCLDP Volumetric Release Criteria; NRC Decommissioning Plan; ALARA Program; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020, 036

Input Descriptions:

1. Radiological characterization data of the entire area identifying contaminated soil areas needing to be remediated.
2. Rerouting or disabling of all impacted utilities
3. Equipment and qualified personnel resources ready to support the operations.

Output Descriptions:

1. Completed Work Instruction Data Package
2. Contaminated soil. Total volume = 2170 ft³
3. Samples to RAL=8 gamma spec and 1 alpha isotopic
4. Job Control Waste volume = 12 ft³
5. Protected and covered excavation areas.

Assumptions:

1. 2.5 % of soil in area (310 ft x 140 ft) will be contaminated and need to be removed to a depth of 2 feet.
2. Removed soil assumed to not be over contaminated drainlines needing to be removed, so soil is not "double counted" in both functions.
3. There will be no significant items remaining on the surface of the soil area to be remediated.
4. No hazardous substances beside radiological contamination will be encountered.

5. Utility surveys will have been performed for preceding characterization activities and will be adequate for remediation.
6. Any identified utilities will have been rerouted or disabled under the storm and sanitary drain relocation functions.
7. A field screening sample will be taken per cu yd of soil removed, with 10% of the total samples being submitted to the RAL for analysis
8. No significant subsurface structures will be encountered to slow productivity.
9. Stability of adjacent buildings is not a concern b/c they'll be demolished
10. Weather and ground water levels will not significantly affect the operations
11. Production rates will be as follows: 2170 cf of soil @337 cf/day/crew with 1 crew

Estimated Time to Plan the Work (Including Review and Approval): 20 days including purchased service contracting.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	1/20/24
Project Manager/HP Manager	HBPM	2/20/64
Task Leader	HBTL	1/20/64
Secretary/Clerical	HBS	1/2/5
Support Professional	HBP	1/20/16
Bartlett Health Physics	HRH	1/5/5

Estimated Time to Perform the Work: 6 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/6/8	N/A	
Project Manager/HP Manager	HBPM	2/6/15	N/A	
Task Leader	HBTL	1/6/39	0	6
Battelle Technician	HBT	1/6/10	0	6
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	1/6/5	N/A	
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			

BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	2/6/103	0	12
Bartlett Maint Specialist	HRDS	1/6/10	0	6
Bartlett Health Physics	HRH	3/6/129	0	18
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Excavation Operator = 48 hours @ \$47.59/hour = \$2,284
- Excavator (PC120) = 6 machine days @\$1,498/mo.= \$2,139

Special Equipment/Material:

Comments/Explanations:

1. Any impacted utilities will be shut off and isolated (due to rerouting or no need for use) and removed if they're in the path of the identified contaminated soil.
2. The oil and gas line depth is 12 feet, is abandoned, and will not be removed or otherwise affected by the remediation work.
3. Intermittent water may be encountered in the excavation, however it will be allowed to dissipate back into the surrounding soil, removed and processed with the contaminated soil (drying agent added), or pumped into 55-gallon drums that will be sampled and free released. This will be an insignificant impact on the operation and waste volumes due to planned measures (protective coverings, weather forecasts) to address this issue.
4. Backfilling of the excavation will be addressed in another function that will address all the similar excavation areas outside the filter beds.

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks

Did we apply a complexity factor during our thought process? Yes, production rates & crew size were based on similar external excavation efforts (JN1 Back Apron), but were adjusted down some (50%) to account for minimal amount of contaminated soil in the area and increased time needed to move machine around from spot to spot.

Completed by: Scott R. Brown (rvw'd DAS)

Date: 5/30/02

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I065

Work Pkg. No.: 7I4-B23

Function Name: Perform JN-1 Back Controlled Area Completion Survey

Component Name: JN-1 Back Controlled Area Completion Survey

Function Description: Perform JN-1 Back Controlled Area Completion Survey

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal

Output Descriptions:

1. 132 gamma spectrum and 13 alpha isotopic
2. Data to report generation

Assumptions:

1. 100% of area will be surveyed.
2. Normal rate for walkover characterization surveys is 200 square meters per technician-hour
3. Area is 24 100 sq. m grids=310'x 140'x 9' = # samples=41x4x3=492 smpls; 2m
4. 20% of grids contaminated = 5 grids
5. Soil Samples 16 samples/d; 20 locations; 60 smpls; 4d to sample
6. 60 samples to lab total
7. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha, alpha + beta 2min counts required, perform smears.
8. 1 d walkover survey
9. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
10. WI under I056
11. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 0 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 5 work days for completion survey

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/5/10	NA	NA
Technical Advisors (Safety)	HBTA	1/5/5	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/5/20	0	5
Battelle Technician (HP)	HBT	1/5/40	0	5
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/5/120	0	30
(Data)		1/5/4	NA	NA
		1/5/40	NA	NA
	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years health physics and radiological release program management

What experience is directly related to BCLDP?

10 years of BCLDP characterization & radiological release program experience

Was a complexity factor used?

No, work was similar to that completed at KA

Completed by: J.F. POLIZIANI

Date: 5/24/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I066

Work Pkg. No.: 7I4-B24

Function Name: Locate JN-1 Front of Building Utilities

Component Name: JN-1 Front of Building

Function Description: Locate underground utilities prior to remediation

Basis of Estimate

Strategy for Accomplishing Function: Procure subcontractor to locate, map and designate utilities.

Applicable Requirements/Procedures:

Approved work instruction; Battelle site maps; HP-AP-1.0, 2.0, 5.0; HS-AP-5.0; PR-AP-17.1; QD-AP-4.1, 7.1

Input Descriptions:

1. West Jeff external areas

Output Descriptions:

1. West Jeff marked utilities.
2. Map of marked utilities

Assumptions:

1. Utilities have not previously been marked and mapped
2. Subcontractor with Battelle support will locate all applicable utilities.
3. Battelle skilled laborer is available to subcontractor for technical/facility issues.

Estimated Time to Plan the Work (Including Review and Approval): 0

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 15 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA			
Project Manager/HP Manager	HBPM	2/1/2	N/A	
Task Leader	HBTL	1/1/8	N/A	
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	1/1/2	N/A	
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	1/1/4	N/A	
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH	1/1/2	N/A	
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Utility locate subcontractor billing rate in FY2000 is \$89.89/hour. Estimate of \$719 for 1 day effort.

Special Equipment/Material: Battelle maps. All other equipment supplied by subcontractor.

Comments/Explanations: Rates based on FY2000 data.

Basis of Estimate:

What is the estimator's experience? Twenty years experience in planning and conduct of government and industrial R&D projects at Battelle

What experience is directly related to BCLDP? Eight years of direct BCLDP experience planning and managing Remedial Action activities including material & utility removal, decontamination, excavation and drain removal, and asbestos abatement

Did we apply a complexity factor during our thought process? No. HP coverage required due to work in controlled area.

Completed by: D. A. Seifert

Date: 05/9/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I068

Work Pkg. No.: 7I2-B05

Function Name: Survey and Monitor JN-1 Front of Building

Component Name: JN-1 Front Area

Function Description: Baseline Characterization of the JN-1 Front Area

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Background levels of radiation must be low to correctly assess background
2. Areas that have undergone material and M&E removal

Output Descriptions:

1. Radiological background established for each material
2. Decision Level Values (DLV) established for each material
3. 24 gamma spectrum and 2 alpha isotopic
4. Data to report generation

Assumptions:

Establish Background & DLVs

1. 2 types of materials exist in the area
2. (40) 1 minute measurements for alpha + beta window per material
3. (40) 1 minute measurements for alpha window per material
4. 3 minute preparation /setup/taking floor & lower wall readings (100%)=12 hrs
5. 1.25 hr to establish DLV for each material (spreadsheet)= 4hrs

Survey

1. 100% of area will be surveyed.
2. Normal rate for walkover characterization surveys is 200 square meters per technician-hour
3. Area is 5 100 sq. m grids = 220' x 24' x 6' = # samples=5x4x4 = 80 smpls; 3m
4. Soil Samples 16 samples/d; 20 locations;80 smpls; 5d to sample
5. Highest Depth Sample per grid (4) x # grids = 20 to lab
6. 5 % of total # exceeds DLV =0.05 x 80384 = 4 to lab
7. 24 samples to lab total
8. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha, alpha + beta 2min counts required, perform smears.
9. 1 d for walkover survey
10. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
11. WI under I056
12. Instrument Calibration 10% time

13. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 0 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 7 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/7/14	NA	NA
Technical Advisors (Safety)	HBTA	1/7/7	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/7/28	0	7
Battelle Technician (HP)	HBT	1/7/56	0	8
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH	3/7/168	0	42
(Instruments)		1/7/7	NA	NA
(Data)		1/7/52	NA	NA
	HRA			

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Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years health physics & radiological release program management

What experience is directly applicable to BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to that at KA

Completed by: J.F. POLIZIANI

Date: 5/25/01

Rev. No.: 21

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I070

Work Pkg. No.: 7I4-B25

Function Name: Remediate JN-1 Front of Building

Component Name: JN-1 Front of Building

Function Description: Remediation of radioactively contaminated soil in the unpaved area in front of Building JN-1. See BCLDP Baseline Planning Diagram dated 7/00; External Areas Baseline Waste Volume (BWV) Table, Pages 1-3, dated 6/9/00; Burgess & Niple Drawings H4, J4, H5, J5 and others dated September '79.

Basis of Estimate

Strategy for Accomplishing Function: Based on detailed characterization sampling results, radioactively contaminated soil will be removed in the subject area. This activity may take place at the same time (or close to) drainline removal (from the subject areas) and soil removal from adjacent areas to maximize operational efficiency. The following activities will be performed until final status surveys indicate acceptable results:

- Installation of a sediment and excavation barrier fence
- Mobilization of an excavator subcontractor and mechanical removal of contaminated soil supplemented by hand digging as necessary.
- Periodic field screening of removed soil by characterization/HP Personnel with confirmatory laboratory analysis of samples.
- Placement of contaminated soil into waste containers and transfer to BCLDP Waste Management
- Protection of excavation openings from environmental and other conditions

Applicable Requirements/Procedures:

BCLDP Volumetric Release Criteria; NRC Decommissioning Plan; ALARA Program; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020, 036

Input Descriptions:

1. Radiological characterization data of the entire area identifying contaminated soil areas needing to be remediated.
2. Rerouting or disabling of all impacted utilities
3. Equipment and qualified personnel resources ready to support the operations.

Output Descriptions:

1. Completed Work Instruction Data Package
2. Contaminated soil. Total volume = 10,560 cu ft
3. Samples to RAL = 39 gamma spectrum and 4 alpha isotopic samples
4. Job Control Waste volume = 31 ft³
5. Protected and covered excavation areas.

Assumptions:

1. 100 % of soil in area is contaminated and will need to be removed to a depth of 2 feet.
2. Removed soil assumed to not be over contaminated drainlines needing to be removed, so soil is not "double counted" in both functions
3. There will be no significant items remaining on the surface of the soil area to be remediated.
4. No hazardous substances beside radiological contamination will be encountered.
5. Utility surveys will have been performed during characterization activities and will be adequate for remediation.

6. Any identified utilities will have been rerouted or disabled under the storm and sanitary drain relocation functions.
7. A field screening sample will be taken per cu yd of soil removed, with 10 % of the total samples being submitted to the RAL for analysis.
8. No significant subsurface structures will be encountered to slow productivity.
9. Stability of adjacent buildings is not a concern b/c they'll be demolished
10. Weather and ground water levels will not significantly affect the operations
11. Production rates will be as follows: 10,560 cu ft of soil @ 674 cu ft/day/crew with 1 crew=16 Days

Estimated Time to Plan the Work (Including Review and Approval): 20 days including purchased service contracting.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	1/20/24
Project Manager/HP Manager	HBPM	2/20/64
Task Leader	HBTL	1/20/64
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/20/16
Bartlett Health Physics	HRH	1/5/5

Estimated Time to Perform the Work: 16 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/16/19	N/A	
Project Manager/HP Manager	HBPM	2/16/38	N/A	
Task Leader	HBTL	1/16/94	0	16
Battelle Technician	HBT	1/16/25	0	16
Battelle Technician O/T	HBTO			
RAL Staff	HL			
Support Professional	HBP	1/16/13	N/A	
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			

Bartlett Technician	HRD	2/16/251	0	32
Bartlett Maint Specialist	HRDS	1/16/25	0	16
Bartlett Health Physics	HRH	3/16/313	0	48
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Excavation Subcontractor Operator = 128 hours @ \$47.59/hour = \$6,092
- Excavator (PC120) rental = 16 machine days @ \$3,855/mo.= \$4,067

Comments/Explanations:

1. Any impacted utilities will be shut off and isolated (due to rerouting or no need for use) and removed if they're in the path of the identified contaminated soil.
2. The oil and gas line depth is 12 feet, is abandoned, and will not be removed or otherwise affected by the remediation work.
3. Intermittent water may be encountered in the excavation, however it will be allowed to dissipate back into the surrounding soil, removed and processed with the contaminated soil (drying agent added), or pumped into 55-gallon drums that will be sampled and free released. This will be an insignificant impact on the operation and waste volumes due to planned measures (protective coverings, weather forecasts) to address this issue.
4. Backfilling of the excavation will be addressed in another function that will address all the similar excavation areas outside the filter beds.

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks

Did we apply a complexity factor during our thought process? Yes, production rates & crew size were based on similar external excavation efforts (JN1 Back Apron)- which were based on other external excavation efforts (such as abandoned north filter beds), and then adjusted down to account for smaller areas closer to the building and use of a smaller excavator.

Completed by: Scott R. Brown (rvw'd DAS)

Date: 6/1/02

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I071

Work Pkg. No.: 7I4-B26

Function Name: Perform JN-1 Front Area Completion Survey

Component Name: JN-1 Front Area Completion Survey

Function Description: Perform JN-1 Front of Building Completion Survey

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal

Output Descriptions:

1. 16 gamma spectrum and 2 alpha isotopic samples
2. Data to report generation

Assumptions:

1. 100% of area will be surveyed.
2. Normal rate for walkover characterization surveys is 200 square meters per technician-hour
3. Area is 5 100 sq. m grids==220'x 24'x 6'==# samples=5x4x4=80 smpls; 3m
4. 1 grids affected (20%)
5. Soil Samples 16 samples/d; 4 locations; 16 smpls; 1d to sample
6. 80 samples to lab total
7. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha,alpha+beta 2min counts required, perform smears.
8. 1 d for walkover survey
9. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
10. WI under I056
11. Instrument Calibration 10% time
12. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 0 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 2 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/2/4	NA	NA
Technical Advisors (Safety)	HBTA	1/2/2	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/2/8	0	2
Battelle Technician (HP)	HBT	1/2/16	0	2
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/2/48	0	12
(Data)		1/2/2	NA	NA
		1/2/16	NA	NA
	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics and radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

Work is similar to KA

Completed by: J.F. POLIZIANI

Date: 5/25/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I074

Work Pkg. No.: 7I2-B06

Function Name: Survey and Monitor JN-1 Diesel Fuel Storage Tank

Component Name: JN-1 Diesel Fuel Storage Tank

Function Description: Baseline Characterization of the JN-1 Diesel Fuel Storage Tank

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal
2. Background radiation levels must be low to evaluate background/set DLVs

Output Descriptions:

1. Establish material background
2. Establish material Decision Level Values (DLVs)
3. Smears to lab 1 per 3 grids (~65)
4. 12 gamma spectrum and 1 alpha isotopic
5. Data to report generation

Assumptions:

Establish background & DLVs

1. 3 types of materials exist in the area
2. (40) 1 minute measurements for alpha + beta window per material
3. (40) 1 minute measurements for alpha window per material
4. 3 minute preparation/setup/taking floor & lower wall readings (100%)= 12hrs
5. 1.25 hr to establish DLV for each material (spreadsheet)=4hrs

Surveys

1. 100% of all pit floor area will be surveyed.
2. 100% of all pit wall area will be surveyed.
3. Normal rate for characterization surveys is 6 square meters per technician-hour
4. Ladder rate for characterization surveys is 5 square meters per technician-hour
5. Soil Samples 1 location/hr; 8 locations; 12 samples total
6. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha,alpha+beta 2min counts required, perform smears.
7. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
8. WI takes 24 hr to prepare/Safety Prof. 8hr for WI/SCL/6 Prof @ 2 hr For Rev/ Appr.
9. Initial Instrument Calibration 8hrs +10% time
10. No significant down time
11. See Assump. D006

Data Technician:

1. Technician inputs 3 data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 5 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	3/4/32
Technical Advisors	HBTA	3/3/20
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	1/1/8
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 2 work day for survey

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/2/4	NA	NA
Technical Advisors (Safety)	HBTA	1/2/2	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/2/8	0	2
Battelle Technician (HP)	HBT	1/2/16	0	3
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/2/48	0	12
(Data)		1/2/3	NA	
		1/2/12	NA	
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics and radiological release program management; 2 years at West Jefferson

What experience is directly related to BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to KA

Completed by: J.F. POLIZIANI

Date: 5/25/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I076

Work Pkg. No.: 7I4-B27

Function Name: Remediate JN-1 Diesel Fuel Storage Tank

Component Name: External JN-1 Diesel Fuel Storage Tank

Function Description: Empty, excavate and remove diesel fuel storage tank adjacent to Building JN-1.

Basis of Estimate

Strategy for Accomplishing Function: Plan activity and prepare work authorization documents. Engage a qualified contractor to pump remaining contents from tank and a contractor to excavate and remove the tank, fill pipe, and supply line to building, all located in a controlled area. Survey the soil overburden as necessary for radioactive contamination to guide disposal destination. Sample soil under tank if fuel leakage is suspected based on discoloration or odor. If necessary, remediate contaminated soil using appropriately trained crew.

Applicable Requirements/Procedures:

BCLDP DD-, HP-, HS-, SIH-, and WM- procedures as appropriate; 29 CFR 1910.120; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0

Input Descriptions:

1. 8000 gallon fuel oil tank (9 ft dia. X 17 ft lg.) with residual fuel buried 2ft below grade.
2. No further requirement for heat or emergency power in Building JN-1.
3. Above grade portion of JN-1 office area will be demolished (preferred but not mandatory).
4. External area characterization data.

Output Descriptions:

1. Residual fuel oil & heel from tank (assume 2000 gal.)
2. Excavated soil overburden (915 cu ft from grade to 5 ft below top of tank).
3. Steel or fiberglass tank (1070 cu ft)
4. Four soil samples for off-site TCLP analysis.
5. Job control waste 19 cu ft.

Assumptions:

1. Removal of residual fuel oil and excavation of tank will be performed by subcontractors with BCLDP support for contamination monitoring and soil disposal.
2. Residual fuel oil will be uncontaminated & removed for commercial disposal. Spillage will be negligible.
3. Tank has not leaked and HAZMAT trained workers will not be required.
4. Soil around tank is uncontaminated and can be returned to the excavation.
5. Assume training not required for fuel pumper.
6. Two of HP technicians perform soil sampling/monitoring.

Estimated Time to Plan the Work (Including Review and Approval): 20 days, includes procurement of excavation contractor and fuel recovery contractor.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	1 / 10 / 10
Project Manager/HP Manager	HBPM	2 / 20 / 40
Task Leader	HBTL	1 / 10 / 20
Secretary/Clerical	HBS	1 / 10 / 10
Support Professional	HBP	
Bartlett Health Physics	HRH	1 / 5 / 5

Estimated Time to Perform the Work: 5 days including 1 day for removal of residual fuel, 2 days for excavation & removal of tank, 2 days for mobilization/demobilization.

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 5 / 5		
Project Manager/HP Manager	HBPM	2 / 5 / 20		
Task Leader	HBTL	1 / 5 / 40		10
Battelle Technician	HBT	1 / 5 / 5		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	2 / 4 / 64	Group 0	16
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH	3 / 2 / 48		12
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

1. Contracted equipment operator with vacuum loader for ½ day and Dispose of sludge = \$8,580
2. BCLDP excavation contractor: 4 days @ \$47.59/hr = \$1,523
3. Clean & transport tank to salvage dump = \$1,017
4. Soil samples (4) for TCLP = \$5,136

Special Equipment/Material: TB025 Excavator – 4 days = \$952

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? Twenty years experience in planning and conduct of government and industrial R&D projects at Battelle

What experience is directly related to BCLDP? Eight years of direct BCLDP experience planning and managing Remedial Action activities including material & utility removal, decontamination, excavation and drain removal, and asbestos abatement

Did we apply a complexity factor during our thought process? No. Performance rate based on similar excavation experience at KA and abandoned filter bed discharge pipe.

Completed by: D. A. Seifert

Date: 4/28/02

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I077

Work Pkg. No.: 7I4-B28

Function Name: Perform JN-1 Diesel Fuel Storage Tank Completion Survey

Component Name: JN-1 Diesel Fuel Storage Tank

Function Description: Baseline Characterization of the JN-1 Diesel Fuel Storage Tank

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal & decontamination

Output Descriptions: data to report generation

Assumptions:

1. 5% of all monitored pit areas were contaminated
2. 100% of all pit floor area were surveyed.
3. 100% of all pit wall area were surveyed.
4. Final Status Survey ---Guard House remains intact
5. Normal rate for characterization surveys is 6 square meters per technician-hour
6. Ladder rate for characterization surveys is 5 square meters per technician-hour
7. The rate for characterization surveys includes: 5cm/sec survey rate, documentation, assess elevated levels>DLV, alpha, alpha + beta 2min counts required, perform smears.
8. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
9. No significant down time

1. **Estimated Time to Plan the Work (Including Review and Approval):** Plan under I074 activity E004

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	NA
Technical Advisors	HBTA	NA
Project Manager/HP Manager	HBPM	NA
Task Leader	HBTL	NA
Secretary/Clerical	HBS	NA
Support Professional	HBP	NA
Bartlett Health Physics	HRH	NA

Estimated Time to Perform the Work: 1 work day for decon survey

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/1/2	NA	NA
Technical Advisors (Safety)	HBTA	1/1/1	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/1/4	0	1
Battelle Technician (HP)	HBT	1/1/8	0	1
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/1/24	0	6
(Data)		1/1/1	NA	NA
		1/1/8	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics and radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to KA

Completed by: J. F. POLIZIANI

Date: 5/25/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I080

Work Pkg. No.: 7I2-B07

Function Name: Survey and Monitor JN-1 Dilution Sump

Component Name: JN-1 Dilution Sump

Function Description: Baseline Characterization of the JN-1 Dilution Sump

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal

Output Descriptions:

1. Establish material background
2. Establish material decision level values (DLV)
3. Smears to lab 1 per 3 grids (~10)
4. 12 gamma spectrum and 1 alpha isotopic sample
5. Data to report generation

Assumptions:

Establish Background & DLVs

1. 3 types of materials exist in the area
2. (40) 1 minute measurements for alpha + beta window per material
3. (40) 1 minute measurements for alpha window per material
4. 3 minute prep/setup/taking floor & lower wall readings (100%)=12hrs
5. 1.25 hr to establish DLV for each material (spreadsheet) = 4 hrs

Survey

1. 100% of all pit floor area will be surveyed.
2. 100% of all pit wall area will be surveyed.
3. Normal rate for characterization surveys is 6 square meters per technician-hour
4. Ladder rate for characterization surveys is 5 square meters per technician-hour
5. Sump is 4'x 4'x 8' L,W,H
6. Soil Samples 1 location/hr; 8 locations; 12 samples total
7. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha, alpha + beta 2min counts required, perform smears.
8. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
9. WI takes 24 hr to prepare/Safety Prof. 8hr for WI/SCL/6 Prof @ 2 hr For Rev/ Appr.
10. Initial Instrument Calibration 8hrs +10% time
11. No significant down time
12. See Assump. D006

13. Confined Space Entry

Data Technician:

1. Technician inputs 3 data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 5 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	3/4/32
Technical Advisors	HBTA	3/3/20
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	1/1/8
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 2 work day for survey

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/2/4	NA	NA
Technical Advisors (Safety)	HBTA	1/2/2	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/2/8	0	2
Battelle Technician (HP)	HBT	1/2/16	0	4
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician--Conf. Spc.	HRD	1/2/16		
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/2/48	0	12
(Data)		1/2/2	NA	NA
		1/2/16	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material: Confined Space Tripod

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to that performed at KA

Completed by: J.F. POLIZIANI

Date: 5/16/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I082

Work Pkg. No.: 7I4-B29

Function Name: Remediate JN-1 Dilution Sump

Component Name: Ext. Area JN-1 Dilution Sump

Function Description: Empty, excavate, and remove tank from ground and stabilize/size reduce for disposal as contaminated waste.

Basis of Estimate

Strategy for Accomplishing Function: Plan activity & prepare work authorization documents. Remove and filter liquid remaining in sump. Solidify, dry and remove heel from bottom of tank. Dispose of both as directed by Waste Management based on sample analyses. Excavate and remove tank from ground, stabilize/seal surfaces, size reduce as appropriate for disposal as contaminated waste.

Applicable Requirements/Procedures:

BCLDP DD-, HP-, HS-, SIH-, and WM- procedures as appropriate; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020, 036

Input Descriptions:

1. Dilution sump (5 ft x 5ft x 8 ft deep) with inlet & outlet piping disconnected.
2. Above grade portion of JN-1 office area will be demolished (preferred but not mandatory).
3. Characterization data for sump contents & surrounding soils.
4. Drums for handling filtered water, containers for disposal of solidified sludge & concrete rubble.

Output Descriptions:

1. Completed work instruction data package
2. Sample for alpha & gamma spectroscopy [1 gamma spectrum and 1 alpha isotopic]
3. Filtered water for evaporation/processing (56 cu ft)
4. Solidified contaminated sludge (32 cu ft @ 4:1 expansion by absorption)
5. Stabilized contaminated concrete rubble/slabs (100 cu ft)
6. Excavated contaminated soil (312 cu ft)
7. Job control waste (74 cu ft)

Assumptions:

1. Removal and filtering of water will require 2 days; absorption/solidification and removal of bottom sludge will take 5 days; drying, decontamination/stabilization of sump interior will take 10 days; excavation & removal of tank will take 3 days using excavation contractor; size reduction of tank for disposal will take 4 days.
2. Contaminated soil under and outside that excavated for removal of the tank will be dealt with as part of Function I058.
3. Removal of sump contents (water & sludge) can be performed at any convenient time. Excavation and removal of the tank should be performed after U/G drain removal and/or building structure removal.

Estimated Time to Plan the Work (Including Review and Approval): 20 days allowing time for sampling & analysis of sump contents.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1 / 1 / 4*
Technical Advisors	HBTA	1 / 10 / 10
Project Manager/HP Manager	HBPM	2 / 20 / 40 1 / 4*
Task Leader	HBTL	1 / 10 / 20
Secretary/Clerical	HBS	1 / 10 / 10
Support Professional	HBP	
Bartlett Health Physics	HRH	1 / 5 / 5
RAL Staff	HBL	1 / 2 / 8

* Additional review time for level 2 hazard rating

Estimated Time to Perform the Work: 24 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 24 / 24		
Project Manager/HP Manager	HBPM	2 / 24 / 96		
Task Leader	HBTL	1 / 24 / 192	Group 0	12
Battelle Technician	HBT	1 / 24 / 24		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	3 / 24 / 424	Group 0 / Group 1	20 / 76
Bartlett Maint Specialist	HRDS	1 / 4 / 16	Group 1	4
Bartlett Health Physics	HRH	3 / 24 / 240	Group 0 / Group 1	9 / 48
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Excavation contractor = 25 hrs. x \$47.59 = \$1,190

Concrete cutting contractor = \$7.93/hr x 1,015 hrs = \$8,049. 1 - TCLP = \$1,284. TB045 Excavator = 3 days = \$989.

Special Equipment/Material: Polyurea encapsulant – 1 gal = \$42.

Air Compressor Rental 130-200<FM = \$687

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? Twenty years experience in planning and conduct of government and industrial R&D projects at Battelle

What experience is directly related to BCLDP? Eight years of direct BCLDP experience planning and managing Remedial Action activities including material & utility removal, decontamination, excavation and drain removal, and asbestos abatement

Did we apply a complexity factor during our thought process? No. Activity assumed to be similar to excavation of sump in KA-3.

Completed by: D. A. Seifert

Date: 4/28/02

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I083

Work Pkg. No.: 7I4-B30

Function Name: Perform JN-1 Dilution Sump Decon Completion Survey

Component Name: JN-1 Dilution Sump

Function Description: Completion Survey Characterization of the JN-1 Dilution Sump

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal & decontamination

Output Descriptions:

1. data to report generation

Assumptions:

1. 5% of all monitored pit areas were contaminated
2. 100% of all pit floor area were surveyed.
3. 100% of all pit wall area were surveyed.
4. Final Status Survey ---Sump Removed
5. Normal rate for characterization surveys is 6 square meters per technician-hour
6. Ladder rate for characterization surveys is 5 square meters per technician-hour
7. The rate for characterization surveys includes: 5cm/sec survey rate, documentation, assess elevated levels>DLV, alpha, alpha + beta 2min counts required, perform smears.
8. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
9. Sump is 4' x 4' x 8' (L,W,H)
10. WI under I080
11. No significant down time
12. Confined Space Entry

Estimated Time to Plan the Work (Including Review and Approval): 0 days; WI under I080

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	NA
Technical Advisors	HBTA	NA
Project Manager/HP Manager	HBPM	NA
Task Leader	HBTL	NA
Secretary/Clerical	HBS	NA
Support Professional	HBP	NA
Bartlett Health Physics	HRH	NA

Estimated Time to Perform the Work: 1 work day for decon survey

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/1/2	NA	NA
Technical Advisors (Safety)	HBTA	1/1/1	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/1/4	0	1
Battelle Technician (HP)	HBT	1/1/8	0	1
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician—Conf Spc.	HRD	1/1/8		
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/1/24	0	6
(Data)		1/1/1	NA	NA
		1/1/8	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate:

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to BCLDP?

10 years of BCLDP characterization & radiological release program experience

Was a complexity factor used?

No, similar to work performed at KA

Completed by: J. F. POLIZIANI

Date: 5/16/00

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I086

Work Pkg. No.: 7I2-B08

Function Name: Survey & Monitor JN-1 Lake Outfall Line

Component Name: JN-1 Lake Outfall Line

Function Description: Baseline Characterization of JN-1 Lake Outfall Line

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal; pipe removed

Output Descriptions:

1. Establish material background
2. Establish material Decision Level Values (DLVs)
3. 98 gamma spectrum; 10 for alpha isotopic spectrum samples
4. Data to report generation

Assumptions:

Establish Background & Decision Level Values

1. 3 types of materials exist in this area
2. (40) 1 minute measurements for alpha + beta window per material
3. (40) 1 minute measurements for alpha window per material
4. 3 minute prep/setup/taking trench & lower wall readings=12 hrs
5. 1.25 hr to establish DLV for each material (spreadsheet) = 4 hrs

Survey

1. Lake Outfall Line is 160' long or 48.8 m
2. Once pipe removed sample every 1m to 1m depth
3. 49 loc x 2 s /loc = 98s total/16s/d= 6.1 d
4. 98 s to lab ; 10 Alpha spec
5. 1 d to do walkover survey
6. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha,alpha+beta 2min counts required, perform smears. 1 d for walkover survey
7. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
8. 10 adjacent grids x 4 loc/grid x 5 s /l = 200 s/16s/d=12.5 d
9. 200s/4 = 50s to lab gamma spec ; 5 alpha spec
10. WI under I149
11. Instrument Calibration 10% time
12. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 0 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional (Line Loc)	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 21 work day for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/21/42	NA	NA
Technical Advisors (Safety)	HBTA	1/21/21	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/21/84	0	21
Battelle Technician (HP)	HBT	1/21/168	0	22
Battelle Technician O/T	HBTO			
RAL Staff	HL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/21/504	0	126
(Data)		1/21/20	NA	NA
		1/21/162	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate:

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used ?

No, work similar to that performed at KA

Completed by: J.F. POLIZIANI

Date: 6/15/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I088

Work Pkg. No.: 7I4-B31

Function Name: Remediate JN-1 Lake Outfall Line

Component Name: JN-1 Lake Outfall Line

Function Description: Removal of radioactively contaminated soil and storm drain piping between the southeast corner of JN-1 and the Battelle Lake. See BCLDP Baseline Planning Diagram dated 7/00; External Areas Baseline Waste Volume (BWV) Table, Pages 1-3, dated 6/9/00; Burgess & Niple Drawings H4, J4, H5, J5 and others dated September '79.

Basis of Estimate

Strategy for Accomplishing Function: Based on detailed characterization sampling results, radioactively contaminated drain piping and surrounding soil will be removed in the subject area. This activity may take place at the same time (or close to) soil removal from adjacent areas to maximize operational efficiency. The following activities will be performed until final status surveys indicate acceptable results:

- Installation of sediment and excavation barrier fences
- Identification/marketing of the drain line location
- Mobilization of an excavator subcontractor and mechanical removal of contaminated soil and drain line supplemented by hand digging as necessary. Periodic field screening of removed soil by characterization/HP Personnel with confirmatory laboratory analysis of contaminated soil by the RAL
- Placement of contaminated soil/drain line into waste containers and transfer to BCLDP Waste Management
- The trenches will be covered and appropriately protected from weather and other elements that may harm their integrity.
- Uncontaminated soil will be staged for backfilling purposes.

Applicable Requirements/Procedures:

BCLDP Volumetric Release Criteria; NRC Decommissioning Plan; ALARA Program; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020, 036

Input Descriptions:

1. Radiological characterization data identifying contaminated drain lines needing to be remediated.
2. Rerouting or disabling of all impacted utilities
3. Equipment and qualified personnel resources ready to support the operations.

Output Descriptions:

1. Completed Work Instruction Data Package
2. Contaminated soil. Total volume = 79 cu ft
3. Contaminated drain line = 88 LF of PVC pipe
4. Samples to RAL= 1 gamma spectrum and 1 alpha isotopic sample
5. Job Control Waste volume = 12 ft³
6. Protected and covered excavation areas.

Assumptions:

1. The drain line (replaced in 1994) is assumed to all have been re-contaminated and needs to be removed (depth of 2 feet).
2. 10% of area underneath drain line will be contaminated in a 3 ft x 3ft area

3. Removed soil assumed to not be over contaminated drainlines needing to be removed, so soil is not "double counted" in both functions
4. There will be no significant items remaining on the surface of the soil area to be remediated.
5. No hazardous substances beside radiological contamination will be encountered.
6. Utility surveys will have been performed for preceding characterization activities and will be adequate for remediation.
7. Any identified utilities will have been rerouted or disabled under the storm and sanitary drain relocation functions.
8. No significant subsurface structures will be encountered to slow productivity.
9. Weather and ground water levels will not significantly affect the operations
10. A field-screening sample will be taken per cu yd of contaminated soil removed, with 10 % of the total samples being submitted to the RAL for analysis.
11. Production rates will be as follows: Drain line & Soil Removal (88 LF)-15LF/day/crew, 1crew/day=6 days

Estimated Time to Plan the Work (Including Review and Approval): 10 days including purchased service contracting.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1/1/2
Technical Advisors	HBTA	1/10/12
Project Manager/HP Manager	HBPM	2/10/32
Task Leader	HBTL	1/10/32
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/10/8
Bartlett Health Physics	HRH	1/5/5

Estimated Time to Perform the Work: 6 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/6/7	N/A	
Project Manager/HP Manager	HBPM	2/6/14	N/A	
Task Leader	HBTL	1/6/35	0	6
Battelle Technician	HBT	1/6/5	0	6
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	1/6/5	N/A	

Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	2/6/94	0	12
Bartlett Maint Specialist	HRDS	1/6/9	0	6
Bartlett Health Physics	HRH	3/6/117	0	18
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Excavation Subcontractor Operator = 48 hrs @ \$47.59/hr =\$2,284
- TB070 Excavator Rental = 6 machine days @ \$1,295/week=\$1,878

Comments/Explanations:

1. Any impacted utilities will be shut off and isolated (due to rerouting or no need for use) and removed if they're in the path of the identified contaminated soil.
2. The oil and gas line depth is 12 feet, is abandoned, and will not be removed or otherwise affected by the remediation work.
3. Intermittent water may be encountered in the excavation, however it will be allowed to dissipate back into the surrounding soil, removed and processed with the contaminated soil (drying agent added), or pumped into 55-gallon drums that will be sampled and free released. This will be an insignificant impact on the operation and waste volumes due to planned measures (protective coverings, weather forecasts) to address this issue.
4. Backfilling of the excavation will be addressed in another function that will address all the similar excavation areas outside the filter beds.

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks

Did we apply a complexity factor during our thought process? Yes, production rates & crew size were based on other external area drain line removal efforts (abandoned north filter beds), but were lowered some to account for working in an environment close to the lake.

Completed by: Scott R. Brown (Rvw'd DAS) **Date:** 6/1/02

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I089

Work Pkg. No.: 7I4-B32

Function Name: Perform JN-1 Lake Outfall Line Completion Survey

Component Name: JN-1 Lake Outfall Line

Function Description: Completion Survey of JN-1 Lake Outfall Line

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal; pipe removed

Output Descriptions:

1. 98 gamma spectrum and 10 alpha isotopic samples
2. Data to report generation

Assumptions:

1. Lake Outfall Line is 160' long or 48.8 m
2. Once pipe removed sample every 1m to 1m depth
3. $49 \text{ loc} \times 2 \text{ s/loc} = 98 \text{ s total} / 16 \text{ s/d} = 6.1 \text{ d} @ 0.1 = 0.6 \text{ d}$
4. $98 \times 0.1 = 10 \text{ s to lab} ; 1 \text{ Alpha spec} < 1 \text{ d to sample } 10/16 = 0.6 \text{ d}$
5. <1 d to do walkover survey
6. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha,alpha+beta 2min counts required, perform smears. 1 d for walkover survey
7. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
8. Adjacent Grids are not contaminated
9. WI under I149
10. Instrument Calibration 10% time
11. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 0 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional (Line Loc)	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 1 work day for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/1/2	NA	NA
Technical Advisors (Safety)	HBTA	1/1/1	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/1/4	0	1
Battelle Technician (HP)	HBT	1/1/8	0	1
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/1/24	0	6
(Data)		1/1/1	NA	NA
		1/1/8	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate**What is the estimator's experience?**

15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to that performed at KA

Completed by: J.F. POLIZIANI

Date: 5/16/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I098

Work Pkg. No.: 7I2-B09

Function Name: Survey and Monitor JN-2 Underground Tank and Sump

Component Name: JN-2 Underground Tank & Sump

Function Description: Baseline Characterization of the JN-2 Underground Tank & Sump

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal & decontamination

Output Descriptions:

1. Establish material background
2. Establish decision level values (DLVs)
3. Data to report generation
4. 10 smears to lab
5. 24 gamma spectrum and 2 alpha isotopic samples

Assumptions:

Establish Background & DLVs

1. 3 types of materials exist in the area
2. (40) 1minute measurements for alpha + beta window per material
3. (40) 1 minute measurements for alpha window per material
4. 3 minute prep/setup/taking floor & lower wall readings (100%) = 12 hrs
5. 1.25 hr to establish DLV for each material (spreadsheet) = 4 hrs

Surveys

1. 5% of all monitored pit areas were contaminated
2. 100% of all pit floor area were surveyed.
3. 100% of all pit wall area were surveyed.
4. Final Status Survey ---Sump Removed
5. Normal rate for characterization surveys is 6 square meters per technician-hour
6. Ladder rate for characterization surveys is 5 square meters per technician-hour
7. The rate for characterization surveys includes: 5cm/sec survey rate, documentation, assess elevated levels>DLV, alpha, alpha + beta 2min counts required, perform smears.
8. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
9. Sump is 4' x 4' x 8' (L,W,H)
10. Tank Pit is 10' x 4' x 4'
11. WI under FY 2001 activity E004
12. No significant down time

13. Confined Space Entry for sump

1. **Estimated Time to Plan the Work (Including Review and Approval):** 0 days; WI under FY 2001 activity E004

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	NA
Technical Advisors	HBTA	NA
Project Manager/HP Manager	HBPM	NA
Task Leader	HBTL	NA
Secretary/Clerical	HBS	NA
Support Professional	HBP	NA
Bartlett Health Physics	HRH	NA

Estimated Time to Perform the Work: 3 work day for survey

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/3/6	NA	NA
Technical Advisors (Safety)	HBTA	1/3/3	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/3/12	0	2
Battelle Technician (HP)	HBT	1/3/24	0	3
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician—Conf Spc.	HRD	1/2/16		
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH	3/3/72	0	12
(Instruments)		1/3/5	NA	NA
(Data)		1/3/18	NA	NA

Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years health physics & radiological release program management

What experience is directly related to BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to that performed at KA

Completed by: J. F. POLIZIANI

Date: 5/17/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I100

Work Pkg. No.: 7I4-B34

Function Name: Remediate JN-2 Underground Tank and Sump

Component Name: Ext. Area JN-2 Underground Tank and Sump

Function Description: Empty, excavate, and remove tank and sump from ground and stabilize/size reduce for disposal as contaminated waste.

Basis of Estimate

Strategy for Accomplishing Function: Plan activity & prepare work authorization documents. Remove and filter liquid remaining in sump. Rinse RAL tank with 50 gal water to suspend heel, remove & filter. Solidify, dry and remove heel from bottom of sump. Dispose of both as directed by Waste Management based on sample analyses. Have utility location contractor verify and remark locations of interfering utilities. Excavate and remove tank & sump from ground, stabilize/seal surfaces, size reduce as appropriate for disposal as contaminated waste.

Applicable Requirements/Procedures:

BCLDP DD-, HP-, HS-, SIH-, and WM- procedures as appropriate; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020, 036

Input Descriptions:

1. Dilution sump (5 ft x 5 ft x 5 ft deep) with inlet & outlet piping disconnected.
2. Emptied RAL waste tank (4 ft dia x 5 ft high) buried 2 ft below grade after wet chemistry analyses no longer required.
3. Above grade portion of JN-2 will be demolished (preferred but not mandatory).
4. Characterization data for sump contents & surrounding soils.
5. Drums for handling filtered water, containers for disposal of solidified sludge & concrete rubble.

Output Descriptions:

1. Completed work instruction data package
2. Sample for alpha & gamma spec & TCLP (\$655 RAL cost) (1 gamma spectrum and 1 alpha isotopic)
3. Filtered rinse water for evaporation/processing (52 gallons)
4. Solidified chlorine/lime sludge (32 cu ft clean, semi-dry)
5. Internally contaminated plastic tank (67 cu ft)
6. Stabilized contaminated concrete rubble/slabs (60 cu ft)
7. Excavated soil (500 cu ft)
8. Job control waste (50 cu ft)

Assumptions:

1. Rinse, removal and filtering of RAL tank contents will require 2 days; absorption/solidification and removal of bottom sludge from sump will take 3 days; drying, decontamination/stabilization of sump interior will take 10 days; excavation & removal will take 3 days using excavation contractor assuming surrounding soil is uncontaminated; size reduction of sump for disposal will take 4 days.
2. Contaminated soil under and outside that excavated for removal of the tanks will be dealt with as part of Function I151.
3. Removal of sump contents (water & sludge) can be performed at any convenient time. Excavation and removal of both tanks should be performed after U/G drain removal and/or building structure removal.

Estimated Time to Plan the Work (Including Review and Approval): 20 days allowing time for sampling & analysis of sump contents, procurement of excavation, concrete cutting, and utility location contractors.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1 / 1 / 4*
Technical Advisors	HBTA	1 / 10 / 10
Project Manager/HP Manager	HBPM	2 / 20 / 40
Task Leader	HBTL	1 / 10 / 20
Secretary/Clerical	HBS	1 / 10 / 10
Support Professional	HBP	
Bartlett Health Physics	HRH	1 / 5 / 5
RAL Staff	HBL	1 / 2 / 8

Estimated Time to Perform the Work: 22 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640
Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 22 / 22		
Project Manager/HP Manager	HBPM	2 / 22 / 88		
Task Leader	HBTL	1 / 22 / 176	Group 0	12
Battelle Technician	HBT	1 / 22 / 22		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	3 / 22 / 336	Group 0 / Group 1	10 / 64
Bartlett Maint Specialist	HRDS	1 / 4 / 16	Group 1	4
Bartlett Health Physics	HRH	3 / 22 / 224	Group 0 / Group 1	12 / 16
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Excavation contractor @ \$47.59/hr ; 24 hrs = \$1142
Concrete cutting contractor @ \$79.31/hr hand held saw = \$2,697; 1 TCLP = \$1,284
Utility locate subcontractor @ \$89.89/hr. 8 hrs = \$760
Air Compressor Rental 130-200 CFM = \$626
TB045 Excavator – 3 days = \$877

Special Equipment/Material: Polyurea encapsulant – 1 gal @ \$42

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? Twenty years experience in planning and conduct of government and industrial R&D projects at Battelle

What experience is directly related to BCLDP? Eight years of direct BCLDP experience planning and managing Remedial Action activities including material & utility removal, decontamination, excavation and drain removal, and asbestos abatement

Did we apply a complexity factor during our thought process? No. Activity expected to be similar to excavations performed at KA.

Completed by: D. A. Seifert

Date: 4/28/02

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I101

Work Pkg. No.: 7I4-B35

Function Name: Perform JN-2 Underground Tank and Sump Completion Survey

Component Name: JN-2 Underground Tank & Sump

Function Description: Baseline Characterization of the JN-2 Underground Tank & Sump

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal & decontamination

Output Descriptions: data to report generation

Assumptions:

1. 5% of all monitored pit areas were contaminated
2. 100% of all pit floor area were surveyed.
3. 100% of all pit wall area were surveyed.
4. Final Status Survey ---Sump Removed
5. Normal rate for characterization surveys is 6 square meters per technician-hour
6. Ladder rate for characterization surveys is 5 square meters per technician-hour
7. The rate for characterization surveys includes: 5cm/sec survey rate, documentation, assess elevated levels>DLV, alpha, alpha + beta 2min counts required, perform smears.
8. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
9. Sump is 4' x 4' x 8' (L,W,H)
10. Tank Pit is 10'x4'x4'
11. WI under FY 2001 activity E004
12. No significant down time
13. Confined Space Entry for sump

1. Estimated Time to Plan the Work (Including Review and Approval): 0 days; Planning under I098

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	NA
Technical Advisors	HBTA	NA
Project Manager/HP Manager	HBPM	NA
Task Leader	HBTL	NA
Secretary/Clerical	HBS	NA
Support Professional	HBP	NA
Bartlett Health Physics	HRH	NA

Estimated Time to Perform the Work: 1 work day for decon survey

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/1/2	NA	NA
Technical Advisors (Safety)	HBTA	1/1/1	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/1/4	0	1
Battelle Technician (HP)	HBT	1/1/8	0	1
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician—Conf Spc.	HRD	1/1/8		
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/1/24	0	6
(Data)		1/1/1	NA	NA
		1/1/8	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate**What is the estimator's experience?**

15 years health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to that performed at KA

Completed by: J. F. POLIZIANI

Date: 5/17/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No: I118

Work Pkg. No.: 7I4-B42

Function Name: Perform JN-3 Reactor Coolant Pump Tank Completion Survey

Component Name: JN-3 Reactor Coolant Pump Tank

Function Description: Tank walls, lid, and floor surfaces will be surveyed consistent with the requirements of NUREG 5849.

Basis of Estimate

Strategy for Accomplishing Function: Tank surfaces will be subjected to the survey and release process defined in NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination".

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization and Final Status Plan for West Jefferson North Site, March 2000; BCLDP Procedure SC-SP-004.1 / SC-SP-004.2; DD-90-02; DD-93-04; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Background Levels of Radiation must be Low to correctly assess background (e.g. JN-1 waste removed or shielded)
2. HEPA/Air Handlers available for working in the tank.
3. Confined space Qualified Personnel ...2 techs inside/ 2 techs outside
- 4.

Output Descriptions:

1. 180 smear samples to the laboratory / data to report generation
2. 2 gamma spectrum and 1 alpha isotopic sample

Assumptions:

Tank Surface:

1. 5% of tank surfaces contaminated; soil assumed clean
2. Tank Dimensions are 36'x 36' x 14'=(10.97m x 10.97m x 4.27m)= 513.86 cu m; 18,144 cu. ft. or 135,717 gallons
3. Each wall is 46.85 sq. m; Area of 4 walls = 187.42 sq. m
4. The floor, inside lid and outer lid are 120.34 sq. m
5. Normal Rate for Characterization Surveys is 6 sq. m per technician-hr. (Tank floor; o. lid & walls to 3m.)
6. Ladder Survey Rate for Pool was assumed to be 4 sq. m per technician-hr. (Inner lid & walls >3m)
7. 70% wall area < 3m; 30% wall area > 3m
8. 2 char. technicians survey inside tank; 1 d to survey inside tank @ 0.05= <1d
9. All work inside tank is confined space entry; not practical to pull lid; 2 qualified watches outside tank mandated
10. All Conf. Space Personnel available; no additional training necessary
11. 1 work day in tank
12. No significant down time
13. Instrument Cal 10 % time for repairs
14. WI under I114

Estimated Time to Plan the Work (Including Review and Approval): Planning under I114

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors (Safety) (Waste Management)	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 1 d to characterize tank

Estimated Resources Required to Perform the Work

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/1/2	NA	NA
Technical Advisors— Safety/Conf. Spc –16 days	HBTA	1/1/8	0	2
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/1/4	0	1
Battelle Technician (HP)/CS- 8days	HBT	1/1/8	0	1
Battelle Technician O/T	HBT0			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	1/1/8	0	1
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Char)	HRH	3/1/8	0	6
Bartlett Health Physics		1/1/8	NA	NA
Instruments		1/1/1	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None Identified

Special Equipment/Material:

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics and radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No work similar to that conducted at KA

Completed by: J.F. Poliziani/D Seifert

Date: 5/13/2002

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I121

Work Pkg. No.: 7I2-B12

Function Name: Survey and Monitor JN-3 Dilution Sump

Component Name: JN-3 Dilution Sump

Function Description: Baseline Characterization of the JN-3 Dilution Sump

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal
2. Background levels of radiation must be low to assess background

Output Descriptions:

1. Establish material background
2. Establish Decision Level Values for each material
3. Smears to lab 1 per 3 grids (~10)
4. 12 gamma spectrum and 1 alpha isotopic sample
5. Data to report generation

Assumptions:

Establish background & DLVs

1. 3 types of materials exist in the area
2. (40) 1 minute measurements for alpha + beta window per material
3. (40) 1 minute measurements for alpha window per material
4. 3 minute prep/setup/taking floor & lower wall readings (100%) = 12 hrs
5. 1.25 hrs to establish DLV for each material (spreadsheet) = 4 hrs

Survey

1. 100% of all pit floor area will be surveyed.
2. 100% of all pit wall area will be surveyed.
3. Normal rate for characterization surveys is 6 square meters per technician-hour
4. Ladder rate for characterization surveys is 5 square meters per technician-hour
5. Sump is 4'x 7'x 8' L,W,H
6. Soil Samples 1 location/hr; 8 locations; 12 samples total
7. The rate for characterization surveys includes: 5cm/sec survey rate, documentation, assess elevated levels > DLV, alpha, alpha + beta 2min counts required, perform smears.
8. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
9. WI takes 24 hr to prepare/Safety Prof. 8hr for WI/SCL/6 Prof @ 2 hr For Rev/ Appr.

10. Initial Instrument Calibration 8hrs +10% time
11. No significant down time
12. See Assump. 11; D006
13. Confined Space Entry

Data Technician:

1. Technician inputs 3 data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 5 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	3/4/32
Technical Advisors	HBTA	3/3/20
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	1/1/8
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 2 work day for survey

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/2/4	NA	NA
Technical Advisors (Safety)	HBTA	1/2/2	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/2/8	0	2
Battelle Technician (HP)	HBT	1/2/16	0	4
Battelle Technician O/T	HBTO			
RAL Staff	HLB			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician--Conf. Spc.	HRD	1/2/16		
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH	3/2/48	0	12

(Instruments)		1/2/4	NA	NA
(Data)		1/2/12	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: Confined Space Tripod

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is related to BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to that performed at KA

Completed by: J.F. POLIZIANI

Date: 5/17/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I124

Work Pkg. No.: 7I4-B43

Function Name: Remediate JN-3 Dilution Sump

Component Name: Ext. Area JN-3 Dilution Sump

Function Description: Empty, excavate, and remove tank from ground and stabilize/size reduce for disposal as contaminated waste.

Basis of Estimate

Strategy for Accomplishing Function: Plan activity & prepare work authorization documents. Remove and filter liquid remaining in sump. Solidify, dry and remove heel from bottom of tank. Dispose of both as directed by Waste Management based on sample analyses. Excavate and remove tank from ground, stabilize/seal surfaces, size reduce as appropriate for disposal as contaminated waste.

Applicable Requirements/Procedures:

BCLDP DD-, HP-, HS-, SIH-, and WM- procedures as appropriate; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020, 034; WA-OP-036, 038

Input Descriptions:

1. Dilution sump (5 ft x 5 ft x 8 ft deep) with inlet & outlet piping disconnected.
2. Above grade portion of JN-3 will be demolished.
3. Characterization data for sump contents & surrounding soils.
4. Drums for handling filtered water, containers for disposal of solidified sludge & concrete rubble.

Output Descriptions:

1. Completed work instruction data package
2. Sample for alpha & gamma spec. & TCLP (1 gamma spectrum and 1 alpha isotopic)
3. Filtered water for evaporation/processing (56 cu ft)
4. Solidified contaminated sludge (32 cu ft @ 4:1 expansion by absorption)
5. Stabilized contaminated concrete rubble/slabs (100 cu ft)
6. Excavated contaminated soil (312 cu ft)
7. Job control waste (107 cu ft)

Assumptions:

1. Removal and filtering of water will require 2 days; absorption/solidification and removal of bottom sludge will take 5 days; drying, decontamination/stabilization of sump interior will take 10 days; excavation & removal of tank will take 3 days using excavation contractor; size reduction of tank for disposal will take 4 days.
2. Contaminated soil under and outside that excavated for removal of the tank will be dealt with as part of Activity I151.
3. Removal of sump contents (water & sludge) excavation and removal of the tank should be performed after U/G drain removal and building structure removal.

Estimated Time to Plan the Work (Including Review and Approval): 20 days allowing time for sampling & analysis of sump contents, procurement of excavation & concrete cutting contractors.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1 / 1 / 4*
Technical Advisors	HBTA	1 / 10 / 10
Project Manager/HP Manager	HBPM	2 / 20 / 40
Task Leader	HBTL	1 / 10 / 20
Secretary/Clerical	HBS	1 / 10 / 10
Support Professional	HBP	
Bartlett Health Physics	HRH	1 / 5 / 5
RAL Staff	HBL	1 / 2 / 8

Estimated Time to Perform the Work: 24 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 24 / 24		
Project Manager/HP Manager	HBPM	2 / 24 / 96		
Task Leader	HBTL	1 / 24 / 192	Group 0	12
Battelle Technician	HBT	1 / 24 / 24		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	3 / 24 / 424	Group 1	144
Bartlett Maint Specialist	HRDS	1 / 4 / 16	Group 1	4
Bartlett Health Physics	HRH	3 / 24 / 240	Group 1	60
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Excavation contractor @ 24 hours = \$1,142.

Concrete cutting contractor @ \$79.31/hr hand held saw = \$2,697. Off-site chem analysis (1 - TCLP) = \$1,284

Air Compressor Rental 130-200 CFM = \$687

TB045 Excavator + delivery - 3 days = \$989

Special Equipment/Material: Polyurea encapsulant - 1 gal @ \$42

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? Twenty years experience in planning and conduct of government and industrial R&D projects at Battelle

What experience is directly related to BCLDP? Eight years of direct BCLDP experience planning and managing Remedial Action activities including material & utility removal, decontamination, excavation and drain removal, and asbestos abatement

Did we apply a complexity factor during our thought process? No. Basis of estimate same as for I082.

Completed by: D. A. Seifert

Date: 4/28/02

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I125

Work Pkg. No.: 7I4-B44

Function Name: Perform JN-3 Dilution Sump Completion Survey

Component Name: JN-3 Dilution Sump

Function Description: Completion Survey of the JN-3 Dilution Sump

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal & decontamination

Output Descriptions:

1. data to report generation

Assumptions:

1. 5% of all monitored pit areas were contaminated
2. 100% of all pit floor area were surveyed.
3. 100% of all pit wall area were surveyed.
4. Final Status Survey ---Sump Removed
5. Normal rate for characterization surveys is 6 square meters per technician-hour
6. Ladder rate for characterization surveys is 5 square meters per technician-hour
7. The rate for characterization surveys includes: 5cm/sec survey rate, documentation, assess elevated levels>DLV, alpha, alpha + beta 2min counts required, perform smears.
8. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
9. Sump is 4' x 7' x 8' (L,W,H)
10. WI under I121
11. No significant down time
12. Confined Space Entry

Estimated Time to Plan the Work (Including Review and Approval): 0 days; WI under I121

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	NA
Technical Advisors	HBTA	NA
Project Manager/HP Manager	HBPM	NA
Task Leader	HBTL	NA
Secretary/Clerical	HBS	NA
Support Professional	HBP	NA
Bartlett Health Physics	HRH	NA

Estimated Time to Perform the Work: 1 work day for decon survey

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/1/2	NA	NA
Technical Advisors (Safety)	HBTA	1/1/1	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/1/4	0	1
Battelle Technician (HP)	HBT	1/1/8	0	1
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician—Conf Spc.	HRD	1/1/8		
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/1/24	0	6
(Data)		1/1/1	NA	NA
		1/1/8	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to BCLDP?

10 years of characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to that performed at KA

Completed by: J. F. POLIZIANI

Date: 5/17/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I133

Work Pkg. No.: 7I4-B45

Function Name: Locate Storm and Sanitary Sewer Line Utilities

Component Name: Storm and Sanitary Sewer Line

Function Description: Locate underground utilities prior to remediation

Basis of Estimate

Strategy for Accomplishing Function: Procure subcontractor to locate, map and designate utilities.

Applicable Requirements/Procedures:

Approved work instruction; Battelle site maps; HP-AP-1.0, 2.0, 5.0; HS-AP-5.0; PR-AP-17.1; QD-AP-4.1, 7.1

Input Descriptions:

1. West Jeff external areas

Output Descriptions:

1. West Jeff marked utilities.
2. Map of marked utilities

Assumptions:

1. Utilities have not previously been marked and mapped
2. Subcontractor with Battelle support will locate all applicable utilities.
3. Battelle skilled laborer is available to subcontractor for technical/facility issues.

Estimated Time to Plan the Work (Including Review and Approval): 0

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 18 days for subcontractor on site to locate utilities, 3-4 days to generate and deliver site map.

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA			
Project Manager/HP Manager	HBPM	2/4/2	N/A	
Task Leader	HBTL	1/4/16	N/A	
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HL			
Support Professional	HBP	1/4/8	N/A	
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	1/4/16	N/A	
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH	1/4/4	N/A	
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Utility locate subcontractor billing rate in FY2000 is \$89.89/hour. Estimate of 32 hours = \$2,876

Special Equipment/Material: Battelle maps. All other equipment supplied by subcontractor.

Comments/Explanations: Rates based on FY2000 data.

Basis of Estimate:

What is the estimator's experience? Twenty years experience in planning and conduct of government and industrial R&D projects at Battelle

What experience is directly related to BCLDP? Eight years of direct BCLDP experience planning and managing Remedial Action activities including material & utility removal, decontamination, excavation and drain removal, and asbestos abatement

Did we apply a complexity factor during our thought process? No.

Completed by: D. A. Seifert

Date: 05/9/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I135

Work Pkg. No.: 7I2-B13

Function Name: Survey and Monitor Storm Sewer Lines

Component Name: Storm Sewer Lines

Function Description: Baseline Characterization Storm Sewer Lines

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849. Sampling/Surveys specific for Geoprobe Sampling along the pipe length to demonstrate release limits are satisfied.

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Background levels of radiation must be low to correctly assess background
2. 3933 ft of storm sewer lines present (Given in I138)
3. 80% of the lines are above release criteria

Output Descriptions:

1. Establish background for each material
2. Establish Decision Level Values (DLVs) for each material
3. 432 gamma spectrum samples
4. 44 alpha isotopic samples
5. Data to report generation

Assumptions:

Establish material background & DLVs

1. 3 types of materials exist in 4 quadrants
2. (40) 1 minute measurements for alpha + beta window per material
3. (40) 1 minute measurements for alpha window per material
4. 3 minute prep/setup/taking floor & lower level wall readings(100%) = 48 hrs
5. 1.25 hr to establish DLV for each material (spreadsheet) =16 hrs

Survey

1. Sample locations @ intervals of 1m
2. Samples will be taken at the surface and @ 1m on the floor or the trench.
3. Sampling rate is 2 samples per hour or 16 s /d
4. $3933\text{ft} \times 0.3048\text{m/ft} \times 0.8 = 960\text{ m}$ to be monitored $\times 2\text{ samples/l} = 1918\text{s}$
5. $1918\text{s}/16\text{s/d} = 120\text{ d}$
6. # samples to lab = 10% total = 192 s; 20 alpha spec
7. 20% of pipe assumed clean
8. Sample at 5 m location intervals to a depth of 12ft
9. $3933\text{ ft} \times 0.3048\text{ m/ft} \times 0.2 = 240\text{ m}$
10. Sample @ 5 m intervals $= 240/5 = 48\text{ locations}$

11. 48 locations to a depth of 4m
12. $48 \text{ l} \times 5 \text{ s/l} = 240 \text{ s} / 16 \text{ s/d} = 15 \text{ d}$
13. $240 = 240 \text{ s to lab; } 24 \text{ alpha spec}$
14. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
15. WI takes 24 hr to prepare/Safety Prof. 8hr for WI/SCL/6 Prof @ 2 hr for Rev/Appr.
16. Line Loc 2x normal rate
17. Calibration – 8 Hr +10% time
18. See Assump.11; D006
19. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 10 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	3/4/32
Technical Advisors	HBTA	3/3/20
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	1/1/8
Support Professional (Line Loc)	HBP	4/10/160
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 135 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/135/270	NA	NA
Technical Advisors (Safety)	HBTA	1/135/135	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/135/540	0	135
Battelle Technician (HP)	HBT	1/135/1081	0	137
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			

BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments) (Data)	HRH	3/135/2850 1/135/19 1/135/1073	0 NA NA	805
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to that performed at KA

Completed by: J.F. POLIZIANI

Date: 6/20/02

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I138

Work Pkg. No.: 7I4-B46

Function Name: Remediate Storm Lines

Component Name: West Jeff External Areas

Function Description: Remediation of radioactively contaminated storm drains in the external areas of the BCLDP West Jefferson North Site. See Battelle Drawing BM-WJ-1-16, Sheet 11 of 16, dated September 8-12-70, revised 8-3-84. Burgess & Niple Drawings H4, J4, H5, J5 and others dated September '79;

Basis of Estimate

Strategy for Accomplishing Function: After all site utilities have been relocated to service JN-4 (non-BCLDP building), and remaining utilities disabled, removal of the subject drainlines will take place. This activity covers drainline removal up to the manhole (# 14 from the Pipe Explorer Report) on the west side of the dam, prior to the road. Multiple crews will be mobilized and the following will be accomplished:

- Identification/marketing of the drainline location on the corresponding ground surface.
- Installation of sediment and barricade fences
- Mechanical removal of soils overlying the drainlines through use of an excavator. Any non-drain utilities encountered in the path will also be removed during this process (mechanically supplemented by hand). Their volume is included in the soil volume and accounted for in the soil removal production rate.
- Soil above the drain lines will be field screened periodically by characterization/HP personnel.
- Mechanical excavation will be halted as drainlines are encountered. Trench boxes will be installed in the trenches if necessary, crews will enter the trenches, carefully remove surrounding soil to fully expose the drainlines, and remove the drainlines in small (2-3 ft) segments. The drain segments will be appropriately emptied, packaged, transported out of the trench, and transferred to BCLDP Waste Management. BCLDP Waste Management will then process the segments for disposal (not addressed in this function).
- Three manholes in the system will be removed through a combination of mechanical and hand operations
- Underlying areas of contaminated soil will then be removed based on radiological characterization survey results
- The trenches will be covered and appropriately protected from weather and other elements that may harm their integrity.
- Uncontaminated soil will be staged for backfilling purposes.

Applicable Requirements/Procedures:

BCLDP Volumetric Release Criteria; NRC Decommissioning Plan; ALARA Program; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0

Input Descriptions:

1. Radiological characterization data indicating contamination levels of the drainlines.
2. Equipment and qualified personnel resources ready to support the operations.
3. Rerouted utilities in place servicing JN-4
4. Disabled utilities remaining in the WJ North grounds that may be impacted by this operation.

Output Descriptions:

1. Completed Work Instruction Data Package
2. Contaminated drain lines (3-6 in. vitrified clay, tile). Total volume = 3146 LF drain line
3. Contaminated soil under drain lines = 2,832 cu ft
4. RAL samples = 10 gamma spec and 1 alpha isotopic samples
5. Job Control Waste volume = 267 cu ft
6. Trenches ready for Final status survey and IVC.

Assumptions:

1. Depth of drain lines assumed to be 4 feet (From Battelle Facilities)
2. 80% of external areas storm drain lines (not including JN-1 Lake Outfall Line) assumed to be contaminated and needing removal
3. 10% of area underneath drain line will be contaminated in a 3 ft x 3 ft area.
4. No hazardous soil beside radiological contamination will be encountered.
5. No contaminated soil will be found during field screening above drain lines and no confirmatory analytical samples will be necessary.
6. The manholes will not be contaminated and can be free released and disposed of as regular waste.
7. No significant subsurface structures will be encountered and need to be moved to access the drainlines.
8. The structures of buildings (they may be removed by this point) will not be impacted by this operation.
9. Utility surveys will be performed for preceding characterization activities and will be adequate for this work as well.
10. Weather and ground water levels will not significantly affect the operations
11. Natural run off (due to removal of storm drains) will be environmentally acceptable and not impact activities.
12. Production rates will be as follows: Drain line & Underlying Contaminated Soil Removal (3146LF)- 15 LF/day/crew, 5 crews/day = 75 lf/day = 42 days

Estimated Time to Plan the Work (Including Review and Approval): 20 Days including purchased service contracting.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	2/20/64
Project Manager/HP Manager	HBPM	2/20/64
Task Leader	HBTL	1/20/64
Secretary/Clerical	HBS	
Support Professional	HBP	1/20/16
Bartlett Health Physics	HRH	1/5/5

Estimated Time to Perform the Work: 42 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/42/50	N/A	
Project Manager/HP Manager	HBPM	2/42/101	N/A	
Task Leader	HBTL	1/42/252	0	42
Battelle Technician	HBT	1/42/34	0	42
Battelle Technician O/T	HBTO			

RAL Staff	HBL			
Support Professional	HBP	1/42/34	N/A	42
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	10/42/3356	0	420
Bartlett Maint Specialist	HRDS	1/42/67	0	42
Bartlett Health Physics	HRH	13/42/4195	0	546
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Excavation Subcontractor Operator = 1680 hrs @ \$47.59/hr = \$79,951
- TB070 Excavator Rental = 210 machine days @ \$3,331/mo = \$36,112
- Trench Box Rental = 210 machine days @ \$1,058/mo = \$11,532

Comments/Explanations:

1. All utilities in the work area will be disabled and will be removed (mechanically and hand) if they are present in the drainline trenches.
2. The oil and gas line depth is 12 feet, is abandoned, and will not be removed or otherwise affected by the remediation work.
3. Intermittent water may be encountered in the excavations, however it will be allowed to dissipate back into the surrounding soil, or pumped into 55-gallon drums that will be sampled and free released. This will be an insignificant impact on the operation and waste volumes due to planned measures (protective coverings, weather forecasts, quick IVC release and backfilling) to address this issue.
4. Final status surveys and IVC release, and subsequent backfilling of the drain trenches are not included here. The operational importance of the timeliness of these activities is not the same as for the filter bed removal activities.

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks

Did we apply a complexity factor during our thought process? Yes-based on similar effort (Remediate Sanitary Sewer Lines), but production rate increased by ~50% to account for shallower depth of storm lines (~3ft) and less manholes (11 vs 3)

Completed by: Scott R. Brown (rvwd-DAS)

Date: 6/13/02

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I139

Work Pkg. No.: 7I4-B47

Function Name: Perform Storm Sewer Lines Completion Survey

Component Name: Storm Sewer Lines

Function Description: Completion Survey of Storm Sewer Lines

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0; HP-AP-2.0; HP-AP-5.0; HP-OP-012; HS-AP-2.0; HS-AP-4.0; HS-AP-5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2; QD-AP-6.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. 3933 ft of storm sewer lines excavated (Given in I196)
2. 80% of the lines are above release criteria

Output Descriptions:

1. 80 gamma spectrum samples
2. 11 alpha isotopic samples
3. Data to report generation

Assumptions:

1. 10% of all locations assumed contaminated; needing resampled
2. Sample locations @ intervals of 1m
3. Samples will be taken at the surface and @ 1m on the floor or the trench.
4. Sampling rate is 2 samples per hour or 16 s/d
5. $3933\text{ft} \times 0.3048\text{m/ft} \times 0.8 = 960\text{ m}$ to be monitored $\times 2\text{ samples/l} = 1918\text{s} \times 0.1 = 192$
6. $192\text{s}/16\text{s/d} = 12\text{ d}$
7. # samples to lab = 10% total + 30 = 49 s; 5 alpha spec; 10% redo = 5 gamma spec; 1 alpha spec
8. 20% of pipe assumed clean
9. Sample at 5 m location intervals to a depth of 12ft
10. $3933\text{ ft} \times 0.3048\text{ m/ft} \times 0.2 = 240\text{ m}$
11. Sample @ 5 m intervals = $240/5 = 48\text{ locations} \times 0.1 = 5\text{ loc.}$
12. 5 locations to a depth of 4m = 25s
13. $25\text{ s}/16\text{s/d} = 2\text{d}$
14. 25s total; , 100% to lab 25s gamma spec; 5 alpha spec
15. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
16. WI under I195
17. Calibration – 10% time
18. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): Planning under I135**Estimated Resources Required to Plan the Work**

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional (Line Loc)	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 14 work days for survey & sampling**Estimated Resources Required to Perform the Work**

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/14/28	NA	NA
Technical Advisors (Safety)	HBTA	1/14/12	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/14/56	0	12
Battelle Technician (HP)	HBT	1/14/121	0	12
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/14/338	0	84
(Data)		1/14/12	NA	
		1/14/112	NA	
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to that performed at KA

Completed by: J.F. POLIZIANI

Date: 6/20/02

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I142

Work Pkg. No.: 7I2-B14

Function Name: Survey and Monitor Road

Component Name: WJ North Site Road

Function Description: Baseline Characterization of WJ North Site Road

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Background levels of radiation must be low to correctly assess background
2. Areas that have undergone material and M&E removal

Output Descriptions:

1. Establish material background
2. Establish decision level values (DLVs) for each material
3. 101 gamma spectrum and 10 alpha isotopic samples
4. Data to report generation

Assumptions:

Establish material background & DLVs

1. 3 types of materials exist in the area
2. (40) 1 minute measurements for alpha + beta window per material
3. (40) 1 minute measurements for alpha window per material
4. 3 minute preparation/setup/taking floor & lower wall readings(100%)=12 hrs
5. 1.25 hr to establish DLV for each material (spreadsheet) = 4 hrs

Survey

1. 100% of area will be surveyed.
2. Normal rate for walkover characterization surveys is 200 square meters per technician-hour
3. Road Area 28 100 sq. m grids=1000' x30 x 6'=# samples=28x4x3=336 smpls; 2m;
4. 336s/ 16s/d = 21d
5. Highest result per depth per grid to lab 28x3=84; 0.05 x 336 exceeds DLV=17 s
6. 101 samples to lab
7. Area adjacent to road in the 11.47 acres survey I149
8. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV, alpha,alpha+beta 2min counts required, perform smears.
9. <1 d for walkover survey
10. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
11. WI under I149
12. Instrument Calibration 10% time
13. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): Planning under I149**Estimated Resources Required to Plan the Work**

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional (Line Loc)	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 23 work days for survey & sampling**Estimated Resources Required to Perform the Work**

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/23/46	NA	NA
Technical Advisors (Safety)	HBTA	1/23/23	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/23/92	0	23
Battelle Technician (HP)	HBT	1/23/184	0	24
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/23/552	0	138
(Data)		1/23/20	NA	NA
		1/23/180	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work is similar to that performed at KA

Completed by: J.F. POLIZIANI

Date: 5/18/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I143

Work Pkg. No.: 7I4-B48

Function Name: Relocate WJ North Utilities

Component Name: West Jeff External Areas

Function Description: Alternative utility lines to service Building JN-4 will be constructed/installed according to detailed engineering specifications developed by a competent engineering firm in consultation with BCO Facilities and the BCLDP. The impact of contaminated areas/utility lines will be minimized during the project design but some BCLDP oversight will be required to deal with potentially contaminated soils and piping in the proximity of the new installations. See Battelle Drawing BM-WJ-1-16, Sheet 11 of 16, dated 8-12-70, revised 8-3-84. Burgess & Niple Drawings H4, J4, H5, J5 and others dated September '79; Battelle Facilities temporary rerouting diagram dated 7-25-00

Basis of Estimate

Strategy for Accomplishing Function: A construction contract will be negotiated to perform utility installations/relocations according to detailed engineering designs and specifications resulting from Activity I198.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04, 05; HP-AP-1.0, 2.0, 5.0; HS-AP-2.0, 4.0, 5.0; PR-AP-17.1; QD-AP-3.2, 4.1, 7.1, 10.1; TD-AP-2.0

Input Descriptions:

1. Detailed engineering designs and specifications for rerouting of water, sewer, communication, and pedestrian/vehicle access to Building JN-4.
2. Radiological characterization data indicating the locations of specific piping and soil/road areas requiring radiological remediation.

Output Descriptions:

1. A completely installed and proper operating alternative utility system.
2. A records package (including internal BCLDP records, Work Instruction Data Packages, Subcontractor Records) supporting all the above work.

Assumptions:

1. Current estimate based on review of available utility diagrams and general rerouting plans. Records will be examined again at time of work for use in detailed identification and design.
2. Affected utilities will include communication lines, natural gas, sanitary sewer from and softened water supply to JN-4 due to their location or intersection with contaminated drains and soil.
3. No significant subsurface structures will be encountered and need to be moved to install utilities.
4. Natural run off (due to removal of storm drains) will be environmentally acceptable and alternative arrangements will not need to be made. This is the current arrangement
5. Active North Filter Bed will remain in service
6. Excavated soil will be used for backfilling purposes
7. Alternative utility installation will take place in uncontaminated soil, although some HP monitoring will be required
8. Weather will not significantly affect the operation
9. Supply waterline rerouting will take place after drains and cont. soil have been removed.
10. Production Rates will be as follows:
 - Supply Water Line-390 LF @62 lf/day=6 days
 - Sanitary Line-675 LF @ 34 lf/day=20 days

Estimated Time to Plan the Work (Including Review and Approval): 60 Days including contract bid and award.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

None. Included under corresponding planning function.

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1/1/2
Technical Advisors	HBTA	1/2/4
Project Manager/HP Manager	HBPM	2/30/80
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 56 days (subject to change based on final scope definition in I198.

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/56/56		
Project Manager/HP Manager	HBPM	1/56/37		
Task Leader	HBTL	1/56/105		
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF	1/56/74		
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH	1/56/105		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Install Supply Water Line; Qty=390LF@ 31.79/LF (escalated)=\$13,131
- Sanitary Line Install: Qty=675 LF @\$82.43/ LF (escalated)=\$55,641

Special Equipment/Material:

Comments/Explanations:

1. The oil and gas line depth is 12 feet, is abandoned, and will not be removed or otherwise affected by the remediation work.

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks, as well as facility impacts on these tasks

Did we apply a complexity factor during our thought process? Yes, production rates and cost of subcontractor efforts were adjusted for working in and around a radiological controlled site.

Completed by: Scott R. Brown (Rvw'd DAS) **Date:** 6/1/02

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I145

Work Pkg. No.: 714-B48

Function Name: Remediate Road

Component Name: Access Road to JN-1, 2, & 3.

Function Description: Remediation of pavement/soil around and under the West Jefferson North Roads Inside the Fenced in Area. See BCLDP Baseline Planning Diagram dated 7/00; External Areas Baseline Waste Volume (BWV) Table, Pages 1-3, dated 6/9/00; Burgess & Niple Drawings H4, J4, H5, J5 and others dated September '79.

Basis of Estimate

Strategy for Accomplishing Function: The entire road area will be removed near the end of the project due to: degradation and wear resulting from its use during the project for operational and waste shipment activities; and contamination present in the material. This activity may take place at the same time (or close to) drainline removal (from the subject areas), and soil removal from adjacent areas (JN-1 Front Apron), to maximize operational efficiency. The following activities will be performed until final status surveys indicate acceptable results:

- Installation of sediment and excavation barrier fences
- Mobilization of an excavator subcontractor and mechanical removal of pavement/asphalt and soil supplemented by hand as necessary.
- Periodic field screening of removed material by characterization/HP Personnel with confirmatory laboratory analysis of contaminated debris.
- Placement of contaminated material into waste containers and transfer to BCLDP Waste Management
- Staging of uncontaminated material for future backfilling or disposal on-site as clean debris.
- Protection of excavation openings from environmental and other conditions

Applicable Requirements/Procedures:

BCLDP Volumetric Release Criteria; NRC Decommissioning Plan; ALARA Program; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020, 036

Input Descriptions:

1. Radiological characterization data of the entire area identifying contaminated areas.
2. Rerouting or disabling of all impacted utilities.
3. Equipment and qualified personnel resources ready to support the operations.

Output Descriptions:

1. Completed Work Instruction Data Package
2. Contaminated soil. Total volume = 6000 cu ft
3. Samples to RAL= 22 gamma spectrum and 2 alpha isotopic samples
4. Job Control Waste volume = 69 ft³
5. Protected and covered excavation areas.

Assumptions:

1. 10% of the road area (6000 cu ft) will be removed and disposed of as radiological waste.
2. Remaining paving and subgrade material (900 ft x 30 ft x 1 ft) will be removed as clean waste.
3. Removed soil assumed to not be over contaminated drainlines needing to be removed, so soil is not "double counted" in both functions.
4. There will be no significant items remaining on the surface of the soil area to be remediated.
5. No hazardous substances beside radiological contamination will be encountered.

6. Utility surveys will have been performed during preceding characterization activities and will be adequate for remediation.
7. Any identified utilities will have been rerouted or disabled under the storm and sanitary drain relocation functions.
8. A field screening sample will be taken per cu yd of material removed, with 10% of the total samples of contaminated material being submitted to the RAL for analysis
9. No significant subsurface structures will be encountered to slow productivity.
10. Stability of adjacent buildings is not a concern b/c they'll be demolished
11. Weather and ground water levels will not significantly affect the operations
12. Production rates will be as follows: 33,000 cu ft of soil @ 674 cu ft/day/crew with 2 crews=25 Days

Estimated Time to Plan the Work (Including Review and Approval): 20 days including purchased service contracting.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1/1/2
Technical Advisors	HBTA	1/20/24
Project Manager/HP Manager	HBPM	2/20/64
Task Leader	HBTL	1/20/64
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/20/16
Bartlett Health Physics	HRH	1/5/5

Estimated Time to Perform the Work: 25 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/25/25	N/A	
Project Manager/HP Manager	HBPM	2/25/60	N/A	
Task Leader	HBTL	1/25/100	0	25
Battelle Technician	HBT	1/25/40	0	25
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	1/25/20	N/A	
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			

BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	4/25/792	0	100
Bartlett Maint Specialist	HRDS	1/25/40	0	25
Bartlett Health Physics	HRH	5/25/990	0	125
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Excavation Subcontractor Operator = 400 hours @ \$47.59/hour = \$19,036
- Excavator (PC120) rental = 50 machine days @ \$3,855/mo= \$10,918

Special Equipment/Material:

Comments/Explanations:

1. Any impacted utilities will be shut off and isolated (due to rerouting or no need for use) and removed if they're in the path of the identified contaminated soil.
2. The oil and gas line depth is 12 feet, is abandoned, and will not be removed or otherwise affected by the remediation work.
3. Intermittent water may be encountered in the excavation, however it will be allowed to dissipate back into the surrounding soil, removed and processed with the contaminated soil (drying agent added), or pumped into 55-gallon drums that will be sampled and free released. This will be an insignificant impact on the operation and waste volumes due to planned measures (protective coverings, weather forecasts) to address this issue.
4. Backfilling of the excavation will be addressed in another function that will address all the similar excavation areas outside the filter beds.

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks

Did we apply a complexity factor during our thought process? Yes, production rates & crew size were based on similar external excavation efforts (JN1 Back Apron)- which were based on other external excavation efforts (such as abandoned north filter beds), and then adjusted down to account for spotty location of contaminated material and the need to separate it from uncontaminated material, smaller areas closer to the buildings, and use of a smaller excavator. Activity I163 (Rem JN-1 Front Apron) is similar.

Completed by: Scott R. Brown (rvs'd by DAS)

Date: 6/5/02

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I146

Work Pkg. No.: 7I4-B49

Function Name: Perform Road Completion Survey

Component Name: WJ North Site Road

Function Description: Perform Completion Survey of WJ North Site Road

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal

Output Descriptions:

1. 11 gamma spectrum and 1 alpha isotopic sample
2. Data to report generation

Assumptions:

1. 100% of area will be surveyed.
2. Normal rate for walkover characterization surveys is 200 square meters per technician-hour
3. Road Area 28 100 sq. m grids=1000' x30 x 6'=# samples=28x4x3=336 smpls; 2m;
4. 10% of road remediated 3 grids
5. 33s/ 16s/d = 2d
6. Highest result per depth per grid to lab 3x3=9; total samples 33 x 0.05=2 smpls to lab exc DLV
7. 11 samples to lab
8. Area adjacent to road in the 11.47 acres survey I149
9. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha,alpha+beta 2min counts required, perform smears.
10. <1 d for walkover survey
11. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
12. WI under I149
13. Instrument Calibration 10% time
14. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): Planning under I149

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional (Line Loc)	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 3 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/3/6	NA	NA
Technical Advisors (Safety)	HBTA	1/3/3	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/3/12	0	3
Battelle Technician (HP)	HBT	1/3/24	0	3
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/3/72	0	18
(Data)		1/3/2	NA	NA
		1/3/24	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate**What is the estimator's experience?**

15 years of health physics & radiological release program management

What experience is directly related to BCLDP?

10years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work is similar to that performed at KA

Completed by: J.F. POLIZIANI

Date: 5/18/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I149

Work Pkg. No.: 7I2-B14

Function Name: Perform Walkover Survey and Hot Spot Sampling of 11.47 Acres Inside Fence

Component Name: 11.47 Acres Inside Fence

Function Description: Survey and monitor 11.47 Acres Inside Fence

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. 400 grids in general area
2. 10% of grids have hotspot contamination in general area
3. 4 samples per hot spot grid (40grids * 4 locations/grid * 2 samples/grid = 320 samples)
4. Perimeter footprints of JN-1,2,3 covered here for hotspots

Output Descriptions:

1. 100 gamma spectrum samples
2. 40 alpha isotopic samples
3. Data to report generation

Assumptions: General Area:

1. 11.47 Acres inside fence = $4047 \text{ m}^2/\text{acre} = 464.2 \text{ grids (110 sq m)}$: ~ 400 grids available for monitoring
2. 4 Sample locations with 2s per loc. ; 320 s
3. Samples will be taken at the surface and @ 1m depth
4. Sampling rate is 2 samples per hour or 16 s/d
5. $400/16\text{s/d} = 25 \text{ d}$
6. # samples to lab = 25% total = $0.25 * 400 = 100 \text{ s}$; 10 alpha spec
7. walkover : $400\text{grids} \times 100\text{m}^2/\text{grid} = 40000 \text{ sq m}/200\text{sq m/tech hr} = 200 \text{ hr}/20 \text{ tech-hr/d} = 10\text{d}$
8. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
9. Calibration – 8 hrs +10% time
10. See Assump.11; D006
11. Line Loc 2x normal rate
12. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 10 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	3/4/32
Technical Advisors	HBTA	3/3/20
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	1/1/8
BCO Skilled Laborer	HCE	4/10/160
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 35 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/35/140	NA	NA
Technical Advisors (Safety)	HBTA	1/35/280	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/35/140	0	70
Battelle Technician (HP)	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	4/35/1120	0	210
(Data)		1/35/35	NA	
		1/35/280	NA	
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release experience; 2yrs at West Jefferson

Was a complexity factor used?

No, work similar to KA

Completed by: J.F. POLIZIANI

Date: 5/31/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I151

Work Pkg. No.: 7I4-B50

Function Name: Remediate Remaining 11.47 Acres Inside Fence

Component Name: 11.47 Inside Fence Area

Function Description: Remediation of radioactively contaminated soil in the area of the Remaining 11.47 Acres Inside the Fenced in Area. See BCLDP Baseline Planning Diagram dated 7/00; External Areas Baseline Waste Volume (BWV) Table, Pages 1-3, dated 6/9/00; Burgess & Niple Drawings H4, J4, H5, J5 and others dated September '79.

Basis of Estimate

Strategy for Accomplishing Function: Based on detailed characterization sampling results, radioactively contaminated soil will be removed in the subject area. This activity may take place at (or close to) the same time drain line removal (from the subject areas) and soil removal from adjacent areas is performed to maximize operational efficiency. The following activities will be performed until final status surveys indicate acceptable results:

- Installation of a sediment and excavation barrier fence
- Mobilization of an excavator subcontractor and mechanical removal of contaminated soil.
- Periodic field screening of removed soil by characterization personnel with confirmatory laboratory analysis of samples.
- Placement of contaminated soil into waste containers and transfer to BCLDP Waste Management.
- Protection of excavation openings from environmental and other conditions.

Applicable Requirements/Procedures:

BCLDP Volumetric Release Criteria; NRC Decommissioning Plan; ALARA Program; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020, 036

Input Descriptions:

1. Radiological characterization data of the entire area identifying contaminated soil areas needing to be remediated.
2. Rerouting or disabling of all impacted utilities completed

Output Descriptions:

1. Equipment and qualified personnel resources ready to support the operations.
2. Completed Work Instruction Data Package
3. Contaminated soil. Total volume = 2480 cf
4. Samples to RAL = 9 gamma spec and 1 alpha samples
5. Job Control Waste volume = 14 ft³
6. Protected and covered excavation areas.

Assumptions:

1. 0.25 % of soil in area (496,000sf) will be contaminated and need to be removed to a depth of 2 feet.
2. Removed soil assumed to not be over contaminated drainlines needing to be removed, so soil is not "double counted" in both functions.
3. There will be no significant items remaining on the surface of the soil area to be remediated.
4. No hazardous substances beside radiological contamination will be encountered.

5. Utility surveys will have been performed for preceding characterization activities and will be adequate for remediation.
6. Any identified utilities will have been rerouted or disabled under prior activities.
7. A field screening sample will be taken per cu ft of soil removed, with 10% of the total samples being submitted to the RAL for analysis
8. No significant subsurface structures will be encountered to slow productivity.
9. Stability of adjacent buildings is not a concern b/c they'll be demolished
10. Weather and ground water levels will not significantly affect the operations
11. Production rates will be as follows: 2480 cf of soil @ 337cf/day=7 Days

Estimated Time to Plan the Work (Including Review and Approval): 20 days including purchased service contracting.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	1/20/24
Project Manager/HP Manager	HBPM	2/20/64
Task Leader	HBTL	1/20/64
Secretary/Clerical	HBS	
Support Professional	HBP	1/20/16
Bartlett Health Physics	HRH	1/5/5

Estimated Time to Perform the Work: 7 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/7/9	N/A	
Project Manager/HP Manager	HBPM	2/7/18	N/A	
Task Leader	HBTL	1/7/44	0	7
Battelle Technician	HBT	1/7/12	0	7
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	1/7/6	N/A	
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			

BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	2/7/118	0	14
Bartlett Maint Specialist	HRDS	1/7/12	0	7
Bartlett Health Physics	HRH	3/7/147	0	21
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Excavation Subcontractor Operator = 56 hours @ \$47.59/hour = \$2,665
- Excavator (PC120) rental = 7 machine days @ \$1498/mo= \$2,567

Special Equipment/Material:

Comments/Explanations:

1. Any impacted utilities will be shut off and isolated (due to rerouting or no need for use) and removed if they're in the path of the identified contaminated soil.
2. The oil and gas line depth is 12 feet, is abandoned, and will not be removed or otherwise affected by the remediation work.
3. Intermittent water may be encountered in the excavation, however it will be allowed to dissipate back into the surrounding soil, removed and processed with the contaminated soil (drying agent added), or pumped into 55-gallon drums that will be sampled and free released. This will be an insignificant impact on the operation and waste volumes due to planned measures (protective coverings, weather forecasts) to address this issue.
4. Backfilling of the excavation will be addressed in another function that will address all the similar excavation areas outside the filter beds.

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks

Did we apply a complexity factor during our thought process? Yes, production rates & crew size were based on similar external excavation efforts (JN1 Back Apron), but were adjusted down some (50%) to account for minimal amount of contaminated soil in the area and increased time needed to move machine around from spot to spot.

Completed by: Scott R. Brown (rvw'd DAS)

Date: 6/1/02

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I152

Work Pkg. No.: 7I4-B51

Function Name: Perform Remaining 11.47 Acres Inside Fence Completion Survey

Component Name: 11.47 Acres Inside Fence

Function Description: Perform Completion survey of 11.47 Acres Inside Fence

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. 10% of areas are contaminated.
2. 50% of 11.47 acres covered here
3. Perimeter footprints of JN-1,2,3 covered here

Output Descriptions:

1. 76 gamma spectrum samples
2. 8 alpha isotopic samples
3. Data to report generation

Assumptions:

General Area:

1. 11.47 Acres inside fence = $4047 \text{ m}^2/\text{acre} = 464.2 \text{ grids (110 sq m)}$
2. 4 Sample locations with 2s per loc.; 3714 s
3. Samples will be taken at the surface and @ 1m depth
4. Sampling rate is 2 samples per hour or 16 s /d
5. 50% of Area covered by building perimeter sampling, JN-1 Apron, Controlled Back Area, & roads
6. Only 50% of Area covered here
7. $3714(0.5)\text{s}/16\text{s}/\text{d} = 123 \text{ d @ } 10\% = 12.3 \text{ d}$
8. # samples to lab = 25% total = $0.25 \times 0.5 \times 3714 = 464 \text{ s}$; 46 alpha spec @ 10%=46 gam; 5 alpha
9. walkover : $232\text{grids} \times 100\text{m}^2/\text{grid} = 23200 \text{ sq m}/200\text{sq m}/\text{tech hr} = 116 \text{ hr}/24 \text{ tech-hr}/\text{d} = 5\text{d @ } 10\% = 1\text{d}$
10. Building Perimeters 59 grids to depth of 4m
11. Sample at 4 location per grid to a depth of 4 m
12. $59 \text{ grid} \times 4 \text{ loc}/\text{grid} \times 5 \text{ s}/\text{loc} = 1180 \text{ s}/16\text{s}/\text{d} = 74\text{d @ } 10\% = 7.4 \text{ d}$
13. $1180/4 \text{ samples to lab} = 295 \text{ s gamma spec}$; 30 alpha spec @ 10%= 30 gamma; 3 alpha
14. $5900 \text{ m}^2/200\text{m}^2 = 29.5 \text{ tech -hr}/24 \text{ tech/hr}/\text{d} = 1.25 \text{ d @ } 10\% = 0.125\text{d}$
15. Total 20d ; 76s to lab gamma spec; 8 s to lab alpha spec; $12.3\text{d} + 7.4\text{d} = 20 \text{ d geoprobe}$
16. Walkover $5+2 = 7 \text{ d @ } 0.1 = 1 \text{ d}$
17. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
18. WI under I149

19. Calibration –10% time
20. See Assump.11; D006
21. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): Planning under I149

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional (Line Loc)	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 21 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/21/42	NA	NA
Technical Advisors (Safety)	HBTA	1/21/21	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/21/84	0	21
Battelle Technician (HP)	HBT	1/21/168	0	21
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/21/504 1/21/17	0 NA	126

(Data)		1/21/168	NA	
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to work completed at WJ in FY01

Completed by: J.F. POLIZIANI

Date: 5/18/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I154

Work Pkg. No.: 7I2-B16

Function Name: Survey and Monitor JN-1 Lake Outfall

Component Name: Lake Outfall Area

Function Description: Survey & Monitor Lake Outfall Area

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Background levels of radiation must be low to correctly assess background
2. Areas that have undergone material and M&E removal
3. Lake level lowered to expose subject area

Output Descriptions:

1. Establish Material Background
2. Establish Decision Level Values (DLVs) for Each Material
3. 63 gamma spectrum and 6 alpha isotopic samples
4. Data to report generation

Assumptions:

Establish Material Backgrounds & DLVs

1. 3 types of materials exist in the area
2. (40) 1 minute measurements for alpha + beta window per material
3. (40) 1 minute measurements for alpha window per material
4. 3 minute preparation /setup/taking floor & lower wall readings (100%) = 12hrs
5. 1.25 hr to establish DLVs for each material (spreadsheet) = 4 hrs

Survey

1. 100% of area will be surveyed.
2. Normal rate for walkover characterization surveys is 200 square meters per technician-hour
3. Area is 5 100 sq. m grids = 85' X 60' x 2' = # samples = 5x4x3 = 60 smpls; 2m;
4. Soil Samples 16 samples/d; 20 locations; 60 smpls; 4d to sample
5. 5 % of total # exceeds DLV = $0.05 \times 60 = 3$ to lab; all samples to lab
6. 63 Samples to Lab
7. Adjacent Grids covered in 11.47 acres I149
8. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels > DLV , alpha, alpha + beta 2min counts required, perform smears.
9. 1 d for walkover survey
10. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
11. WI under I149
12. Calibration – 10% time
13. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): Planning under I149**Estimated Resources Required to Plan the Work**

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTB	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional (Line Loc)	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 6 work days for survey & sampling**Estimated Resources Required to Perform the Work**

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/6/12	NA	NA
Technical Advisors (Safety)	HBTB	1/6/6	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/6/24	0	35
Battelle Technician (HP)	HBT	1/6/48	0	36
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/6/144	0	144
(Data)		1/6/8	NA	NA
		1/6/42	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience. 2 years at West Jefferson

Was a complexity factor used?

No, work similar to that performed at KA

Completed by: J.F. POLIZIANI

Date: 5/18/00

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I156

Work Pkg. No.: 7I4-B52

Function Name: Remediate JN-1 Lake Outfall

Component Name: JN-1 Lake Outfall

Function Description: Remediation/removal of radioactively contaminated soil in the outfall area to the east of JN-1. See BCLDP Baseline Planning Diagram dated 7/00; External Areas Baseline Waste Volume (BWV) Table, Pages 1-3, dated 6/9/00; Burgess & Niple Drawings H4, J4, H5, J5 and others dated September '79.

Basis of Estimate

Strategy for Accomplishing Function: Based on detailed characterization sampling results, radioactively contaminated soil will be removed in the subject area. This activity may take place at the same time (or close to) drainline removal (from the subject areas) and soil removal from adjacent areas is performed to maximize operational efficiency. The following activities will be performed until final status surveys indicate acceptable results:

- Installation of sediment and excavation barrier fences
- Mobilization of an excavator subcontractor and mechanical removal of contaminated soil supplemented by hand digging as necessary.
- Periodic field screening of removed soil by characterization/HP Personnel with confirmatory laboratory analysis by the RAL
- Placement of contaminated soil/drain line into waste containers and transfer to BCLDP Waste Management
- Protection of excavation openings from environmental and other conditions

Applicable Requirements/Procedures:

BCLDP Volumetric Release Criteria; NRC Decommissioning Plan; ALARA Program; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020, 036

Input Descriptions:

1. Radiological characterization data of the entire area identifying contaminated soil areas needing to be remediated.
2. Rerouting or disabling of all impacted utilities
3. Equipment and qualified personnel resources ready to support the operations.

Output Descriptions:

1. Completed Work Instruction Data Package
2. Contaminated soil. Total volume = 510 cu ft
3. Samples to RAL= 2 gamma spectra and 1 alpha isotopic sample
4. Job Control Waste volume = 3 ft³
5. Protected and covered excavation areas.

Assumptions:

1. 5 % of the soil in area (85ft x 60ft) is assumed to be contaminated and need to be removed to a depth of 2 feet.
2. Work can be performed during period when lake level has been lowered without impacting other D&D activities.
3. Removed soil assumed to not be over contaminated drainlines needing to be removed, so soil is not "double counted" in both functions

4. There will be no significant items remaining on the surface of the soil area to be remediated.
5. No hazardous substances beside radiological contamination will be encountered.
6. Utility surveys will have been performed during preceding characterization activities and will be adequate for remediation.
7. Any identified utilities will have been rerouted or disabled under the storm and sanitary drain relocation functions.
8. No significant subsurface structures will be encountered to slow productivity.
9. Stability of adjacent buildings is not a concern because they'll be demolished
10. Weather and ground water levels will not significantly affect the operations
11. A field screening sample will be taken per cu yd of soil removed, with 10 % of the total samples being submitted to the RAL for analysis.
12. Production rates will be as follows: 510 cu ft of soil @337 cu ft/day/crew with 1 crew=2 days

Estimated Time to Plan the Work (Including Review and Approval): 10 days including purchased service contracting.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1/1/2
Technical Advisors	HBTA	1/10/12
Project Manager/HP Manager	HBPM	2/10/32
Task Leader	HBTL	1/10/32
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/10/8
Bartlett Health Physics	HRH	1/5/5

Estimated Time to Perform the Work: 2 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/2/2	N/A	
Project Manager/HP Manager	HBPM	2/2/4	N/A	
Task Leader	HBTL	1/2/9	0	2
Battelle Technician	HBT	1/2/2	0	2
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	1/2/1	N/A	
Secretary/Clerical	HBS			

Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	2/2/32	0	2
Bartlett Maint Specialist	HRDS	2/2/2	0	2
Bartlett Health Physics	HRH	3/2/48	0	6
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Excavation Operator = 16 hours @ \$47.59/hour = \$761
- Excavator (PC120) rental = 2 machine days @\$428/day= \$1,069

Special Equipment/Material:

Comments/Explanations:

1. Any impacted utilities will be shut off and isolated (due to rerouting or no need for use) and removed if they're in the path of the identified contaminated soil.
2. The oil and gas line depth is 12 feet, is abandoned, and will not be removed or otherwise affected by the remediation work.
3. Intermittent water may be encountered in the excavation, however it will be allowed to dissipate back into the surrounding soil, removed and processed with the contaminated soil (drying agent added), or pumped into 55-gallon drums that will be sampled and free released. This will be an insignificant impact on the operation and waste volumes due to planned measures (protective coverings, weather forecasts) to address this issue.
4. Backfilling of the excavation will be addressed in another function that will address all the similar excavation areas outside the filter beds.
- 5.

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks

Did we apply a complexity factor during our thought process? Yes, production rates & crew size were based on similar external excavation efforts (JN1 Back Apron), but were adjusted down some (50%) to account for minimal amount of contaminated soil in the area, working near the lake, and increased time needed to move machine around from spot to spot.

Completed by: Scott R. Brown (Rvw'd DAS) **Date:** 6/1/02

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I157

Work Pkg. No.: 7I4-B53

Function Name: Perform JN-1 Lake Outfall Completion Survey

Component Name: Lake Outfall Area

Function Description: Lake Outfall Area Completion Survey

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal

Output Descriptions:

1. 12 gamma spectrum and 1 alpha isotopic sample
2. Data to report generation

Assumptions:

1. 100% of area will be surveyed.
2. Normal rate for walkover characterization surveys is 200 square meters per technician-hour
3. Area is 5 100 sq. m grids==85' X 60'x 2'==# samples=5x4x3=60 smpls; 2m;
4. Contamination Level @ 20%; 1grid x 4 d x 3s/d =12 s
5. Soil Samples 12 samples/d; 4 locations;12 smpls; <1d to sample
6. 12 Samples to Lab
7. Adjacent Grids covered in 11.47 acres I149
8. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha,alpha+beta 2min counts required, perform smears.
9. <1 d for walkover survey
10. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
11. WI under I149
12. Calibration – 10% time
13. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): Planning under I149

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional (Line Loc)	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 1 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/1/2	NA	NA
Technical Advisors (Safety)	HBTA	1/1/1	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/1/4	0	1
Battelle Technician (HP)	HBT	1/1/8	0	1
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/1/24	0	18
(Data)		1/1/1	NA	NA
		1/1/8	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 yrs at West Jefferson.

Was a complexity factor used?

No, work similar to KA

Completed by: J.F. POLIZIANI

Date: 5/31/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I161

Work Pkg. No.: 7I2-B17

Function Name: Survey and Monitor JN-1 Front Apron

Component Name: JN-1 Front Apron

Function Description: Survey & Monitor JN-1 Front Apron

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal
2. Background levels of radiation must be low to correctly assess background

Output Descriptions:

1. Establish material background
2. Establish Decision Level Values (DLVs)
3. 58 gamma spectrum and 6 alpha isotopic samples
4. Data to report generation

Assumptions:

Establish backgrounds & DLVs

1. 3 types of materials exist in the area
2. (40) 1 minute measurements for alpha + beta window per material
3. (40) 1 minute measurements for alpha window per material
4. 3 minute preparation/setup/taking floor & lower wall readings (100%)=12hrs
5. 1.25 hrs to establish DLV for each material spreadsheet = 4 hrs

Surveys

1. 100% of area will be surveyed.
2. Normal rate for walkover characterization surveys is 200 square meters per technician-hour
3. Area is 16 100 sq. m grids=300'x 56'x 6'==# samples=16x4x3=192 smpls; 2m
4. Soil Samples 16 samples/d; 64 locations;19248 smpls; 12d to sample
5. $192 \times 0.05 = 10$ samples Exceed DLV
6. 58 samples to lab total
7. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha,alpha+beta 2min counts required, perform smears.
8. 1 d for walkover survey
9. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
10. WI under I056
11. Instrument Calibration 10% time
12. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 0 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 14 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/14/28	NA	NA
Technical Advisors (Safety)	HBTA	1/14/14	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/14/56	0	14
Battelle Technician (HP)	HBT	1/14/112	0	15
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/14/336 1/14/12	0 NA	84 NA
(Data)		1/14/108	NA	NA
	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor applied?

No, Work is similar to KA

Completed by: J.F. POLIZIANI

Date: 5/22/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I163

Work Pkg. No.: 7I4-B54

Function Name: Remediate JN-1 Front Apron

Component Name: JN-1 Front Apron

Function Description: Removal of pavement/soil in the area of the JN-1 Front Apron. See BCLDP Baseline Planning Diagram dated 7/00; External Areas Baseline Waste Volume (BWV) Table, Pages 1-3, dated 6/9/00; Burgess & Niple Drawings H4, J4, H5, J5 and others dated September '79.

Basis of Estimate

Strategy for Accomplishing Function: The entire front apron area will be removed near the end of the project due to degradation and wear resulting from its use during the project for operational and waste shipment activities and contamination present in the material. This activity may take place at (or close to) the same time drain line removal (from the subject areas) and soil removal from adjacent areas are performed to maximize operational efficiency. The following activities will be performed until final status surveys indicate acceptable results:

- Installation of sediment and excavation barrier fences.
- Mobilization of an excavator subcontractor and mechanical removal of pavement/asphalt and soil supplemented by hand as necessary.
- Periodic field screening of removed material by characterization/HP Personnel with confirmatory laboratory analysis of contaminated debris.
- Placement of contaminated material into waste containers and transfer to BCLDP Waste Management
- Staging of uncontaminated material for future backfilling or disposal on-site as clean debris.
- Protection of excavation openings from environmental and other conditions

Applicable Requirements/Procedures:

BCLDP Volumetric Release Criteria; NRC Decommissioning Plan; ALARA Program; DD-90-02; BCLDP-90-1; DD-93-03, 04 & 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0 & 29.0; HP-OP-011, 012, 019 & 106; HS-AP-2.0, 4.0 & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1 QD-AP-4.1, 5.2, 6.1 & 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0 & 3.0; WA-OP-020 & 036

Input Descriptions:

1. Radiological characterization data of the area identifying contaminated spots.
2. Rerouting or disabling of all impacted utilities completed.
3. Equipment and qualified personnel resources ready to support the operations.

Output Descriptions:

1. Completed Work Instruction Data Package
2. Contaminated soil. Total volume= 3360 cu ft
3. Samples to RAL = 12 gamma spec and 1 alpha
4. Job Control Waste volume = 75 ft³
5. Protected and covered excavation areas.

Assumptions:

1. Entire area (300 ft x 56 ft x 2 ft) will be removed
2. 10% of material removed (3360 cu ft) will be contaminated and disposed of as radiological waste.
3. Removed soil assumed to not be over contaminated drainlines needing to be removed, so soil is not "double counted" in both functions.
4. There will be no significant items remaining on the surface of the soil area to be remediated.
5. No hazardous substances beside radiological contamination will be encountered.
6. Utility surveys will have been performed during preceding characterization activities and will be adequate for remediation.
7. Any identified utilities will have been rerouted or disabled under the storm and sanitary drain relocation functions.
8. A field screening sample will be taken per cu yd material removed, with 10% of the total samples of contaminated material being submitted to the RAL for analysis
9. No significant subsurface structures will be encountered to slow productivity.
10. Stability of adjacent buildings is not a concern b/c they'll be demolished
11. Weather and ground water levels will not significantly affect the operations
12. Production rates will be as follows: 33,600 cu ft of soil @ 674 cu ft/day/crew with 2 crews=25 Days

Estimated Time to Plan the Work (Including Review and Approval): 20 days including purchased service contracting.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1/1/2
Technical Advisors	HBTA	1/20/24
Project Manager/HP Manager	HBPM	2/20/64
Task Leader	HBTL	1/20/64
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/20/16
Bartlett Health Physics	HRH	1/5/5

Estimated Time to Perform the Work: 25 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/25/30	N/A	
Project Manager/HP Manager	HBPM	2/25/60	N/A	
Task Leader	HBTL	1/25/150	0	25
Battelle Technician	HBT	1/25/40	0	25
Battelle Technician O/T	HBTO			

RAL Staff	HBL			
Support Professional	HBP	1/25/20	N/A	
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	4/25/798	0	20
Bartlett Maint Specialist	HRDS	1/25/40	0	10
Bartlett Health Physics	HRH	5/25/997	0	30
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Excavation Subcontractor Operator = 400 hours @ \$47.59/hour = \$19,036
- Excavator (PC120) rental = 50 machine days @ \$3855/mo= \$10,918

Special Equipment/Material:

Comments/Explanations:

1. Any impacted utilities will be shut off and isolated (due to rerouting or no need for use) and removed if they're in the path of the identified contaminated soil.
2. The oil and gas line depth is 12 feet, is abandoned, and will not be removed or otherwise affected by the remediation work.
3. Intermittent water may be encountered in the excavation, however it will be allowed to dissipate back into the surrounding soil, removed and processed with the contaminated soil (drying agent added), or pumped into 55-gallon drums that will be sampled and free released. This will be an insignificant impact on the operation and waste volumes due to planned measures (protective coverings, weather forecasts) to address this issue.
4. Backfilling of the excavation will be addressed in another function that will address all the similar excavation areas outside the filter beds.

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks

Did we apply a complexity factor during our thought process? Yes, production rates & crew size were based on similar external excavation efforts (JN1 Back Apron)- which were based on other external excavation efforts (such as abandoned north filter beds), and then adjusted down to account for spotty location of contaminated material and the need to separate it from uncontaminated material, smaller areas closer to the buildings, and use of a smaller excavator.

Completed by: Scott R. Brown (Rvs'd DAS)

Date: 6/5/02

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I164

Work Pkg. No.: 7I4-B55

Function Name: Perform JN-1 Front Apron Completion Survey

Component Name: JN-1 Front Apron Completion Survey

Function Description: Perform JN-1 Front Apron Completion Survey

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Areas that have undergone material and M&E removal

Output Descriptions:

1. 48 gamma spectrum and 5 alpha isotopic samples
2. Data to report generation

Assumptions:

1. 100% of area will be surveyed.
2. Normal rate for walkover characterization surveys is 200 square meters per technician-hour
3. Area is 16 100 sq. m grids==310'x 56'x 9'==# samples=16x4x3=192 smpls; 2m
4. 4 grids affected (20%)
5. Soil Samples 16 samples/d; 4 locations;48 smpls; 3d to sample
6. 48 samples to lab total
7. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha,alpha+beta 2min counts required, perform smears.
8. 1 d for walkover survey
9. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
10. WI under I161
11. Instrument Calibration 10% time
12. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): Planning under I161

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 4 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/4/8	NA	NA
Technical Advisors (Safety)	HBTA	1/4/4	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/4/16	0	4
Battelle Technician (HP)	HBT	1/4/32	0	4
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/4/96 1/4/3	0 NA	24 NA
(Data)		1/4/32	NA	NA
	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor applied?

No, work similar to KA

Completed by: J.F. POLIZIANI

Date: 5/22/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I165

Work Pkg. No.: 7I4-B56

Function Name: Plan and Remediate JN-10 / JN-11 Grounds (Columns/Sanitary Tank)

Component Name: JN-10 Grounds

Function Description: Remove the JN-10 / JN-11 support services and return the JN-10 Area back into a field. Items to be removed include buried utilities such as gas lines, water lines, electric lines, telephone lines, sanitary lines, and a sanitary tanks; auxiliary structures such as awnings, foundations, sidewalks, concrete pads, and firewalls. Dispose of these items through the local landfill program. The entire area will then be re-graded and re-seeded.

Basis of Estimate

Strategy for Accomplishing Function: Generate a contract to perform the above scope of work. Since this is non-radioactive and common construction remediation work, Means Estimating data will be used to support this estimate.

Applicable Requirements/Procedures:

BCLDP and CFR regulations as appropriate; DD-93-04, 05; HS-AP-2.0, 4.0, 5.0; PR-AP-17.1; QD-AP-4.1, 7.1; SIH-PP-04; TD-AP-2.0

Input Descriptions:

1. There are no hazardous constituents in the work area and the area is dedicated for this work
2. The work instruction and procedures are in place sufficiently early to perform this activity on schedule
3. JN-10 and JN-11 are relocated or sold to another site by the DOE

Output Descriptions:

1. JN-10 building area prepared to turn over to BCO as a field. 600 cubic yards of construction debris.

Assumptions:

1. The area is essentially non-radioactive and does not fall into the BCLDP radioactive guidelines.
2. Manpower, equipment, resources, and the area are available for this activity when scheduled
3. There are no RCRA considerations in the area
4. The work is performed as a normal construction demolition

Estimated Time to Plan the Work (Including Review and Approval): 100 Days for both the contract award and the supporting work instruction package.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	4 / 5 / 10
Technical Advisors	HBTA	1 / 100 / 20
Project Manager/HP Manager	HBPM	1 / 100 / 200
Task Leader	HBTL	1 / 100 / 10
Secretary/Clerical	HBS	1 / 100 / 40
Support Professional	HBP	1 / 100 / 10
Bartlett Health Physics	HRH	1 / 5 / 10

Estimated Time to Perform the Work: 70 Days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 70 / 20		
Project Manager/HP Manager	HBPM	1 / 70 / 300		
Task Leader	HBTL			
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	1 / 70 / 20		
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	1 / 70 / 30		
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH			
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Construction Contractor - \$196,947. RS Means Data located in the baseline backup data for the 7/21/00 estimate (escalated). Removal of the extra piers for JN-11 are estimated at an additional \$2,983.

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 21 years in the nuclear design field for DOE contractors (13 years as project manager / engineering manager / baseline manager in the D&D field at various DOE sites). 7 years as BCLDP Building / Project Manager

What experience is directly related to BCLDP? 7 years as BCLDP Building / Project Manager

Did we apply a complexity factor during our thought process? No, this is a straight forward process.

Completed by: C. Voth

Date: 04/30/02

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I176

Work Pkg. No.: 7I4-B57

Function Name: Build JN-4 Access Road

Component Name: JN-4 Access Road

Function Description: An alternative road to the active research building JN-4 will need to be constructed because the current road will be destroyed/demolished as a result of remediation of radioactively contaminated pavement/soil in the road surfaces and heavy truck traffic associated with building demolition. See BCLDP Baseline Planning Diagram dated 7/00; Burgess & Niple Drawings H4, J4, H5, J5 and others dated September '79. JN-4 New Road Justification Document

Basis of Estimate

Strategy for Accomplishing Function: An engineering firm will be engaged to design and specify a new access road to Building JN-4 from the North Research Area west security gate as part of engineering planning for isolation of JN-4 from BCLDP affected areas (Activity I198). Once a decision is made to move forward, a design will be finalized, a contractor procured, and the road constructed.

Applicable Requirements/Procedures:

N/A-needed to prevent disruption of ongoing research operations

Input Descriptions:

1. Decision to remove current road due to contamination and access issues.
2. Design for the new road.

Output Descriptions:

1. New alternative road to JN-4
2. Records documenting this activity

Assumptions:

1. New road will be constructed in uncontaminated soil
2. There will be no significant obstacles encountered in the path of the new road.
3. All utilities will have been relocated or otherwise not impacted.
4. 30 days will be needed to finalize design, prepare and distribute bid package, and evaluate/select/schedule a subcontractor.
5. Weather will not significantly affect the operation
6. Work will generally be overseen by BCO Facilities management.
7. Nominal BCLDP HP/Characterization support will be provided to assure excavated soil is not contaminated.
8. Production rates will be as follows:
 - Layout and Set Grade Stakes, Qty = 1125 LF, Prod rate=1125/day, = 1 day
 - Fine Grading (Large Area), Qty = 2222 sq yds, Prod rate=2000sq yd/day, = 2 days
 - Asphalt Paving, Qty=20,000 sq ft, Prod rate=9000sq ft/day, = 3 days

Estimated Time to Plan the Work (Including Review and Approval): 30 Days including purchased service contracting.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1/1/2
Technical Advisors	HBTA	1/2/4
Project Manager/HP Manager	HBPM	1/30/40
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	
BCO Special Project	HCF	1/30/16
Bartlett Health Physics	HRH	1/5/5

Estimated Time to Perform the Work: 10 days including mobilization.

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/10/10		
Project Manager/HP Manager	HBPM	1/10/10		
Task Leader	HBTL			
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF	1/10/40		
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH	3/3/48		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Layout and Set Grade Stakes, Qty = 1125 LF @ \$1240/day = \$1,240
- Fine Grading (Large Area), Qty=2222 sq yds @ \$.69/sq yd = \$1,533
- Asphalt Paving, Qty=20,000 sq ft, @ \$1.75/sq ft = \$35,000

Special Equipment/Material:

Comments/Explanations:

1. The oil and gas line depth is 12 feet, is abandoned, and will not be removed or otherwise affected by the remediation work.

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks, as well as facility impacts on these tasks

Did we apply a complexity factor during our thought process? No. All work is outside the fence at the WJ area, so no additional factors were needed.

Completed by: Scott R. Brown (updt'd by DAS)

Date: 6/3/02

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I179

Work Pkg. No.: 7I4-B58

Function Name: Remove Rad Lab Trailer

Component Name: Rad Lab Trailer

Function Description: Remove the Rad Lab Trailer from West side of the JN-1 facility.

Basis of Estimate

Strategy for Accomplishing Function: The Rad Lab Trailer will be released and returned to whom it was leased from.

Applicable Requirements/Procedures:

DD-90-02; DD-93-02, 04; HP-AP-1.0, 2.0, 5.0; HP-OP-011, 012, 019; HS-AP-5.0; HS-OP-001; MA-AP-20.2; PR-AP-17.1; QD-AP-5.2, 6.1; TD-AP-2.0

Input Descriptions:

- No longer a site need for on site Rad Lab.
- A list of Battelle and DOE equipment that will be used in this Lab and its final destination is not known but a general estimation is being made.

Output Descriptions:

Free Released Waste/Material	2200 cu ft
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Assumptions:

- The Rad Lab Trailer can be removed when there is no longer a need for onsite lab rad analysis.
- The equipment and trailer will be free released during removal.

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	2/2/4
Technical Advisors	HBTA	2/1/8
Project Manager/HP Manager	HBPM	2/5/20
Task Leader	HBTL	1/2/4
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	1/1/8
Bartlett Health Physics	HRH	1/1/4

Estimated Time to Perform the Work: 20 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 20 / 20		
Project Manager/HP Manager	HBPM	2 / 20 / 40		
Task Leader	HBTL	1 / 20 / 40		
Battelle Technician	HBT	1 / 20 / 20		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	1 / 5 / 40		
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	1 / 20 / 160		
Bartlett Maint Specialist	HRDS	1 / 20 / 20		
Bartlett Health Physics	HRH	3 / 20 / 480		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 15 years experience in operational planning and execution in both private industry and DOE projects.

What experience is directly related to BCLDP? 5 years of direct experience in D&D of nuclear facilities within the DOE complex.

Did we apply a complexity factor during our thought process? The estimate was based on prior experience conducting similar work on the BCLDP. No complexity factor was used.

Completed by: P. Weaver

Date: 5/10/01

Rev. No.: 0

☐ JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity Number: I180 / I80A

Work Package: 7I4-B61

Includes Sub Activity Number: I180A Rad Lab Trailer Lease Cost

Function Name: Establish New Radioanalytical Laboratory (RAL)

Component Name: New Radioanalytical Laboratory

Function Description: Relocation of the RAL in order to perform analytical analysis of environmental and project samples.

Basis of Estimate

Strategy for Accomplishing Function:

Lease 36' x 70' custom transportable building for the wet chemistry laboratory and count room. Use surplused Sealand for storage space and/or space in JN10 for clean storage.

Alternative strategies considered included: 1) availability of Battelle facility for wet chemistry laboratory; 2) sending all samples that require analytical preparation offsite for analysis; and 3) leasing four 36' x 70' custom transportable buildings for wet chemistry and count room relocation.

Applicable Requirements/Procedures:

1. For the transportable building, ES&H procedures for hood certification, HEPA filter testing and flow, and readiness reviews for air velocity and negative pressure.
2. BCLDP, HP-, HS- procedures as appropriate.
3. Facility permits as appropriate.

Input Descriptions:

1. JN-2 1st floor count room and lab (currently 2466 sq. ft.). Equipment includes Alpha/Gamma Spectroscopy system – main VAX computer and x-terminal, 16 alpha spectroscopy detectors, 2 gamma detectors plus lead shielding, and Gamma Analyst (automatic gamma counter), two low background alpha/beta counting system, and top loading balance. Also, require liquid nitrogen and P-10 gas storage areas.
2. Above includes 1st floor storage area includes chemical storage cabinet, flammable liquid storage cabinet, marinelli sample containers, backup equipment, laboratory supplies (paper towels, beakers, etc.).
3. Above includes 1st floor wet chemistry laboratory. Equipment includes muffle furnace, microwave, drying oven, and balances. One fume hood will need to be replaced along with a canopy hood.

Output Descriptions:

1. Wet chemistry laboratory and count room will be relocated to leased 36' x 70' custom transportable building.
2. Storage items relocated to Sealand (possibility that JN10 space will be available for clean storage).

Assumptions:

1. Environmental sample preparation and analysis will be conducted onsite.
2. Relocation of the RAL will take place according to the JN-2 demolition schedule.
3. The 36'x70' transportable building will be placed on existing foundation pads in front of JN-3 hooked to existing services (water, electric, communication) at JN4 (per Cid Voth).
4. This data sheet includes the support utilities and building modifications required for a fully functional laboratory.
5. Commercial movers will be used to do the moving of counting equipment and laboratory glassware.

6. A Sealand will become available when the RAL needs to relocate.
7. Occupancy inspection and city permits not required because the transportable building is a temporary structure.
8. RAL will move from one controlled area to another – eliminates free release criteria for RAL equipment.
9. Environmental laboratory (located on the 2nd floor of JN2) hoods and cabinets can be removed and installed in the transportable building.
10. Surplused fume hood, laboratory counters and cabinets available from Battelle for the transportable building.
11. Waste Management will be responsible for disposing/surplusing equipment, unusable radioactive standards, miscellaneous laboratory supplies, and furniture that will not be relocated with the RAL.
12. Surplused breathing air waste tank should be available for use as the waste storage tank (above ground) for the laboratory setup in the transportable building.
13. Surplused emergency generator from the breathing air system should be available for use as backup power supply for the transportable building.
14. Transporting chemicals and radioactive standards from JN2 to transportable buildings located adjacent to JN3 will not require DOT shipping papers and DOT package containers. The chemicals will be segregated and packed in boxes and moved to new laboratory using a non-motorized form of transport (per S. Schmucker).

Estimated Time to Plan the Work (Including Review and Approval): 60 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1 / 60 / 60
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	2 / 60 / 480
Task Leader	HBTL	
Secretary/Clerical	HBS	1 / 10 / 40
Support Professional	HBP	4 / 60 / 200
Bartlett Health Physics	HRH	1 / 60 / 60
RAL Staff	HBL	2 / 60 / 480

Estimated Time to Perform the Work: 80 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 80 / 20		
Project Manager/HP Manager	HBPM	2 / 80 / 640		
Task Leader	HBTL	1 / 80 / 640		

Battelle Technician	HBT	2 / 3 / 32		
Battelle Technician O/T	HBTO			
RAL Staff	HBL	2 / 80 / 400		
Support Professional	HBP	1 / 80 / 600		
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO	1 / 80 / 80		
BCO Skilled Laborer	HCE	2 / 80 / 542		
BCO Skilled Laborer O/T	HCEO			
BCO Special Project	HCF	1 / 80 / 20		
Bartlett Technician	HRD	1 / 5 / 20		
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH	2 / 10 / 80		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

1. Leasing four 36' x 70' transportable buildings \$1,031/month – \$45,364,000 for 44 months. Cost based on leasing quote from a 24' x 70' transportable building from Modular Buildings.
2. Canberra Industries Inc. service technicians – analytical equipment move to include preparing equipment for move and start up after relocating - allow \$5,552.
3. Deliver building and anchor, ramp, etc. (per previous installation) - \$43,438
4. Modifications to building for lab application - \$44,490
5. New laboratory fume-hoods, ventilation and cabinets - \$202,591
6. Utilities to building from JN-4 system - \$54,245
7. Mixed gamma radioanalytical standards for recalibration of gamma system. This includes: 800 mL solid, 1.5 L liquid, 250 mL vegetation, 100 g petri dish, single filter, quarterly stack filter, 500 mL liquid, 100 mL liquid, deep planchet geometries - \$8,672
8. Offsite radioanalytical services performed by General Engineering Laboratory and/or BWXT Services, Inc. (cost TBD).
9. Alternate option if laboratory fume hood, cabinets/or bench tops unavailable at the time of relocation. VWR Scientific – fume hood and laboratory bench space with sink for installation in two 8' x 44' transportable building (cost TBD).

Other Direct Cost: Movers 104 Hrs @\$25/Hr = \$2,600

Special Equipment/Material:

Comments/Explanations:

1. RAL must submit a modification to the Radioactive Materials Application (RMA) for the new location.
2. RAL must notify the State of Utah within two weeks after the move in order to maintain certification.

Basis of Estimate:

What is the estimator's experience? 21 years in the nuclear design field for DOE contractors (13 years as project manager / engineering manager / baseline manager in the D&D field at various DOE sites).

What experience is directly related to BCLDP? 7 years as BCLDP Building / Project Manager

Did we apply a complexity factor during our thought process? Yes, installing laboratories into temporary building structures is a complex task. Also, regulatory approvals and utility connections from JN-4 may be an issue.

Completed by: C. Voth (rvwd DAS)

Date: June 17, 2002

Rev. No.: 2

FY 03 ☒ FY 04 ☒ FY 05 ☒ FY 06 ☐ FY 07 ☐ FY 08 ☐ FY 09

Activity Number: I181 **Work Package Number:** 7I4--B60

WBS Number: 7I4

WBS Title: Obtain and Install New Access Control Point

Work Package Title: Relocation of the West Jefferson Health Physics Control Point

Work Package Description: A modular office type unit will be leased and set up to house the health physics control point operations from the time Building JN-1 is converted to a de-energized building in preparation for demolition until all radiological controlled work is completed at the West Jefferson site. Transfer of the internal building alarms will not occur but telephone, fax, and network access will be required. It should serve as a transition point from released and radiological work areas.

Basis of Estimate

Strategy for Accomplishing Task: Acquire a modular unit for the West Jefferson Site HP Control Point with functions that adequately support operations and that cost effectively accommodates a range of D&D planning options

Applicable Requirements/Procedures:

1. OSHA for temporary facilities

Input Descriptions:

1. Received technical input from health physics professionals assigned to the BCLDP; received technical and costing input from Facility Operations personnel.

Output Descriptions:

1. Relocated health physics control point.
2. Health physics control point that adequately supports all radiological control aspects of the D&D operation.

Assumptions:

1. Estimates based on a quoted lease option and continual scope of work
 - Experienced Technical Advisor from Facilities Operations walked down the relocation area and reviewed requirements specified by health physics professionals.

Estimated Time to Plan the Work (Including Review and Approval): 20 days

1. Planning to include project personnel and personnel to coordinate--10 hours

Estimated Resources Required to Plan the Work:

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	N/A
Technical Advisors	HBTA	N/A
Project Manager/HP Manager	HBPM	2 / 10 / 40
Task Leader	HBTL	1 / 10 / 20
Secretary/Clerical	HBS	N/A
Support Professional	HBP	1/ 10 / 10
Bartlett Health Physics	HRH	N/A
BCO Skilled Laborer	HCE	N/A

Estimated Time to Perform the Task: 40 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; e.g., 4/20/640

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA		N/A	N/A
Manager/Senior Staff	HBB		N/A	N/A
Technical Advisors	HBTA	1/40/40	N/A	N/A
Project Manager/HP Manager	HBPM	2/40/320	N/A	N/A
Task Leader	HBTL	1/40/160	N/A	N/A
Battelle Technician	HBT		N/A	N/A
Battelle Technician O/T	HBTO		N/A	N/A
RAL Staff	HBL		N/A	N/A
Support Professional	HBP	1/ 40/ 120	N/A	N/A
Secretary/Clerical	HBS		N/A	N/A
Decon Ops Hourly	HBH		N/A	N/A
BCO Support	HBCO		N/A	N/A
BCO Skilled Laborer	HCE		N/A	N/A
BCO Skilled Laborer O/T	HCEO		N/A	N/A
BCO Facility Manager	HCF		N/A	N/A
Bartlett Technician	HRD		N/A	N/A
Bartlett Maint Specialist	HRDS		N/A	N/A
Bartlett Health Physics	HRH	1/40/8	N/A	N/A
Bartlett Admin Support	HRA		N/A	N/A

Subcontract/Purchased Service:

With escalation

1. Telecommunications (ADC/Blackbox) - 40 hours @ \$45/hr inside office = \$1,904
2. Mid-City Electric - 80 hours @ \$44.96/hr inside office = \$3,597
3. Electric service from JN-2 substation - (\$4,276) plus transformer (\$5,758) = \$10,034
4. Gas Service (trench 150 ft/ Means) = \$2,386
5. Communications (JN1 Manhole new trench and manhole/ Means) = \$3,209
6. Lease at \$687.38/month (36 Mo) + Deliveries/Exit \$6632 = \$31,378
7. Foundations, Set, Anchor, Seam, Ramp, Skirt = \$29,010
8. Configuration modifications of module= \$21,150

9. Move personnel, equipment, etc. = \$3,000

Special Equipment/Material:

Comments/Explanations: Items for relocation not included: furniture, filing cabinets, office supplies, health physics computer, access control badge reader, "man down" button

Basis of Estimate:

What is the estimator's experience? 21 years in the nuclear design field for DOE contractors (13 years as project manager / engineering manager / baseline manager in the D&D field at various DOE sites).

What experience is directly related to BCLDP? 7 years as BCLDP Building / Project Manager

Did we apply a complexity factor during our thought process? No, this is a straight forward process.

Completed by: Cid Voth

Date: 06/14/02

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I182

Work Pkg. No.: 7I4-B62

Function Name: Backfill External Areas Inside Fence

Component Name: West Jeff External Areas

Function Description: Clean backfilling of areas inside the fence where soil and other material were removed during BCLDP Remediation Activities

Basis of Estimate

Strategy for Accomplishing Function: After corresponding remediation has been completed, and final status /IVC verification obtained, areas will need to be backfilled to return the site to a safe and environmentally sound condition.

Applicable Requirements/Procedures:

Input Descriptions:

1. Acceptable Final Status/IVC Radiological Characterization Data.
2. Clean fill material – 5062 cu yd

Output Descriptions:

1. Satisfactorily backfilled areas.
2. Records documenting this activity

Assumptions:

1. Volumes of backfill work based on volumes of corresponding remediation (pavement/soil removal) work (see tasks I058,I064,I070,I138,I145,I151,I156,I163)
2. Backfill to be granular material and will be compacted in small lifts.
3. Work performed near end of project without any radiological restrictions
4. Weather will not significantly affect the operation
5. Production rates will be as follows: 5062 cu yd of material @ 800 cu yd/day = 7 Days

Estimated Time to Plan the Work (Including Review and Approval): 10 Days including purchased service contracting.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1/1/2
Technical Advisors	HBTA	1/2/4
Project Manager/HP Manager	HBPM	1/10/16
Task Leader	HBTL	
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 7 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA			
Project Manager/HP Manager	HBPM	1/7/8		
Task Leader	HBTL	1/7/13		
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	1/7/5		
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH			
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Backfilling : 5062 cu yd @ \$71.38/cu yd=\$361,326

Special Equipment/Material:

Comments/Explanations:

1. Subcontractor cost based on Elford Estimate to Battelle for similar work

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks, as well as facility impacts on these tasks

Did we apply a complexity factor during our thought process? No. All work is to be completed without any radiological concerns, so no additional factors were needed.

Completed by: Scott R. Brown (rvs'd by DAS)

Date: 6/3/02

Rev. No.: 3

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I183

Work Pkg. No.: 7I4-5B63

Function Name: Removal of Remaining Items

Component Name: West Jeff External Areas

Function Description: Removal of items associated with the BCLDP after all contamination has been removed and IVC surveys completed.

Basis of Estimate

Strategy for Accomplishing Function: At the end of BCLDP decontamination work, the area at the West Jefferson North site will be in an "end-state" condition. In order to prepare the land for effective reuse for future purposes, some remaining items will need to be removed. Subcontractors will perform the work, with oversight by BCLDP and/or Battelle Facilities representatives. Items planned to be removed include:

- JN-2 columns from 6 feet below grade to the bottom of the columns
- Remaining approx. 20% of the underground drain lines outside the foot print of the buildings
- All other abandoned utilities outside the footprint of the buildings
- JN-6, JNT-2, Old Guard House

Applicable Requirements/Procedures:

Input Descriptions:

1. Acceptable Final Status/IVC Radiological Characterization Data.

Output Descriptions:

1. Satisfactory removal of items including back-filling excavations & grading
2. Records documenting this activity
3. Job control waste – 15 cu ft

Assumptions:

1. All work to be performed without any radiological restrictions since it will be after final site IVC release is obtained.
2. Characterization will take 1-2 soil samples daily during excavation to verify radiological status.
3. Planned end-state scenarios as noted in BCLDP remediation plans will not change.
4. Production rates to be as noted in Elford subcontractor estimates.

Estimated Time to Plan the Work (Including Review and Approval): 60 Days including bid and award process for construction contractor.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	1/10/10
Project Manager/HP Manager	HBPM	2/60/40
Task Leader	HBTL	
Secretary/Clerical	HBS	1/10/10
Support Professional	HBP	
Bartlett Health Physics	HRH	1/5/5

Estimated Time to Perform the Work: 60 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 60 / 60		
Project Manager/HP Manager	HBPM	1 / 60 / 120		
Task Leader	HBTL			
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH	2 / 60 / 240	Group 0	60
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Excavation/demolition contractor with all necessary equipment and personnel to supervise and perform the listed activities. \$432,618 per estimate from Elford, Inc (escalated).

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? Twenty years experience in planning and conduct of government and industrial R&D projects at Battelle

What experience is directly related to BCLDP? Eight years of direct BCLDP experience planning and managing Remedial Action activities including material & utility removal, decontamination, excavation and drain removal, and asbestos abatement

Did we apply a complexity factor during our thought process? No. All work is assumed to be performed after radiological release of the site and IVC confirmation. Battelle management oversight will be required to assure conformance to contract requirements and OSHA regulations.

Completed by: David A. Seifert

Date: 4/28/02

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☐ Ext. Area ☒ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity Number: I184

Work Package Number: 7I4-B59

Function Name: Remove Air Stations

Component Name: Environmental monitoring

Function Description: When BCLDP D&D is considered complete by IVC, no contractual or regulatory requirements exist that would require air monitoring to continue. Therefore, at that point in time, air monitoring stations could be removed.

Basis of Estimate

Strategy for Accomplishing Function:

1. BCLDP electrician will de-energize air stations.
2. Environmental Operations personnel will remove stations

Applicable Requirements/Procedures:

"This is a necessary activity in order to return government equipment and remove it from the site."

Input Descriptions:

1. N/A

Output Descriptions:

1. N/A

Assumptions:

1. Environmental sampling will remain at current levels until completion of BCLDP.
2. AMS-4 stack monitors will be removed incrementally as source term decreases.
3. BCLDP Environmental Operations will not be responsible for wiring/conduit and concrete pads.
4. All removed equipment will be turned over to government property.

Estimated Time to Plan the Work (Including Review and Approval): N/A

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 5 hours

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA			
Project Manager/HP Manager	HBPM			
Task Leader	HBTL			
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	Electrician 2 hours		
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	20 hours		
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH			
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: N/A

Special Equipment/Material: N/A

Comments/Explanations: N/A

Completed by: Tracy D. Chance

Date: 5/21/01

Rev. No.: 2

Estimator's experience: 17 years in engineering/ES&H

BCLDP Experience: 8.5 years

Complexity Factor: N/A

☐ JN-1 ☐ JN-2 ☐ JN-3 ☐ Ext. Area ☒ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity Number: I185

Work Package Number: 7I4-B59

Function Name: Remove Wells

Component Name: Environmental monitoring

Function Description: When BCLDP D&D is considered complete by IVC, no contractual or regulatory requirements exist that would require groundwater monitoring to continue. Therefore, at that point in time, monitoring wells could be removed.

Basis of Estimate

Strategy for Accomplishing Function:

1. Subcontractors will properly abandon wells.
2. Environmental Operations personnel will supervise and assist subcontractors with well removal as needed.

Applicable Requirements/Procedures:

OAC 3701-28-07; PR-AP-17.1.

Input Descriptions:

1. N/A

Output Descriptions:

1. Properly abandoned wells

Assumptions:

1. 24 wells will be removed.
2. 1 well (C03) will remain and become the responsibility of BCO Environmental Operations

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	1/Year/12
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	1/Year/12
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 4 days; after IVC approval

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA			
Project Manager/HP Manager	HBPM	1/4/8		
Task Leader	HBTL			
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAI Staff	HBL			
Support Professional	HBP	1/4/32		
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH			
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Sprowls well drilling:

- 21 2" wells @ \$956.47 ea = \$20,086
- 3 4" wells @ \$1542.31 ea = \$4,627.

Special Equipment/Material:

1. Drill rig
2. Bentonite grout
3. Drums
4. High pressure washer

Comments/Explanations: N/A

Completed by: Tracy D. Chance

Date: 5/21/01

Rev. No.: 2

Estimator's experience: 17 years in engineering/ES&H

BCLDP Experience: 8.5 years

Complexity Factor: N/A

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I190

Work Pkg. No.: 7I4-B07

Function Name: Deployment of the Wide System

Component Name: West Jeff External Areas

Function Description: The WIDE system performs in-situ remediation of low conductivity soils . It is presently being used for the deeper contamination found in the North Abandon Filter Bed. See Characterization Results Sept-Nov 2000

Basis of Estimate

Strategy for Accomplishing Function

We plan to remove the Cesium through use of the WIDE system. This system extracts the Cesium while leaving the soil in place. HP and Characterization Personnel will assist in screening the process to confirm expected contamination levels and provide worker protection. The system pumps a fluid into the ground to mobilize the Cesium from the clay fines and extracts the chemically changed liquid for filtration. The Cesium is deposited on filters for disposal and the fluid is recharged with chemical and re-injected into the field. Current plans are for waste containers to be mechanically transported up the gravel road and staged/loaded into waste disposal and transportation vehicles. Waste disposal costs are not accounted for here.

Applicable Requirements/Procedures:

BCLDP Volumetric Release Criteria; NRC Decommissioning Plan; ALARA Program; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-3.2, 4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020, 036

Input Descriptions:

1. Radiological characterization data of the entire area.
2. Completed Work Instruction Planning Package including Radiological Work Permit (RWP), Industrial Safety Checklist, Waste Management Checklist and other attachments.
3. Completed and approved Operating Procedure for the WIDE Operations
4. Equipment and qualified personnel resources ready to support the operations.

Output Descriptions:

1. Completed Work Instruction Data Package
2. 600 gamma spec samples, 60 alpha samples
3. Waste Volume is 30 cu ft of filters
4. Job Control Waste volume = 100 cu ft PPE, plastics

Assumptions:

1. Entire area of 10 grids to be processed to a depth of 9 feet.
2. No hazardous substances beside radiological contamination will be encountered.
3. No components of the two abandoned north filter beds will be encountered, only soil will need to be processed.
4. Recent utility surveys performed for characterization activities are adequate for remediation and no other utilities will be found in the work area.
5. Work can be performed without any special regulatory requirements/restrictions due to proximity of the Big Darby Creek
6. Weather and ground water levels will not significantly affect the operations
7. Production rates will be as follows: Nominally one grid/ month with 3 pore volumes used for extraction.

Estimated Time to Plan the Work (Including Review and Approval): 10 days, most of the planning completed previous year.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

None. Included under corresponding planning function.

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1 /10/20
Technical Advisors	HBTA	1/10/10
Project Manager/HP Manager	HBPM	2/10/40
Task Leader	HBTL	1/10/20
Secretary/Clerical	HBS	1/10/10
Support Professional	HBP	
Bartlett Health Physics	HRH	1/5/5

Estimated Time to Perform the Work: 220 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/220/20		
Technical Advisors	HBTA	1/220/80	N/A	
Project Manager/HP Manager	HBPM	2/220/880	N/A	
Task Leader	HBTL	1/220/1760	0	220
Battelle Technician	HBT	1/220/100		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	1/220/100	N/A	
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
Bartlett Technician	HRD	2/220/3520	0	660
Bartlett Maint Specialist	HRDS	1/220/200	0	50
Bartlett Health Physics	HRH	1/220/1760	0	440
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Technical soils support contractor = 1945 hrs @ \$54.35/hr = \$105,711

Special Equipment/Material:

Comments/Explanations:

1. The oil and gas line depth is 12 feet, is abandoned, and will not be removed or otherwise affected by the remediation work.
2. Intermittent water may be encountered in the process, however it will be allowed to dissipate back into the surrounding soil, removed and processed with the contaminated fluid, or pumped into a holding tank that will be sampled and free released. This will be an insignificant impact on the operation and waste volumes due to planned measures (protective coverings, weather forecasts, quick IVC release and backfilling) to address this issue.

Basis of Estimate:

What is the estimator's experience? 21 years in the nuclear design field for DOE contractors (13 years as project manager / engineering manager / baseline manager in the D&D field at various DOE sites). 7 years as BCLDP Building / Project Manager

What experience is directly related to BCLDP? 7 years as BCLDP Building / Project Manager

Did we apply a complexity factor during our thought process? yes, this is a straight forward process but involves changing operating parameters with different soil conditions.

Completed by: Sidney B. Voth/D Seifert

Date: 5/3/02

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I191

Work Pkg. No.: 7I4-B07

Function Name: Demobilization of the Wide System

Component Name: West Jeff External Areas

Function Description: After completion of the WIDE system deployment, the system components will be disassembled, decontaminated and removed, or disposed of as low level waste. The top foot of soil in the deployment area will then be excavated and removed for disposal as low level waste.

Basis of Estimate

Strategy for Accomplishing Function

Upon completion of the WIDE deployment, the equipment, and tent will be removed, decontaminated, and surveyed for release/disposal. One foot of soil (6000 cu ft) excavated from the field to finish the remediation of the activity. HP and Characterization Personnel will assist in screening items to confirm expected contamination levels and provide worker protection. It is anticipated that only the filter housings, one pump, one 3000 gallon tank and associated piping will have to be disposed of as LLW. Current plans are for waste containers to be mechanically transported up the gravel road and staged/loaded into waste disposal and transportation vehicles. Waste disposal costs are not accounted for here. The area will then be monitored and released under a separate activity.

Applicable Requirements/Procedures:

BCLDP Volumetric Release Criteria; NRC Decommissioning Plan; ALARA Program; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-3.2, 4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020, 036

Input Descriptions:

1. The WIDE system equipment and deployment area at the conclusion of remediation activities.
2. Completed Work Instruction Planning Package including Radiological Work Permit (RWP), Industrial Safety Checklist, Waste Management Checklist and other attachments.
3. Equipment and qualified personnel resources ready to support the operations.

Output Descriptions:

1. Completed Work Instruction Data Package
2. Monitoring commensurate with releasing equipment
3. Waste Volume is 300 cu ft of piping, equipment, etc. and 6000 cu ft of soil
4. Job Control Waste volume = 400 cu ft PPE, plastics
5. Fully restored, graded, seeded, and mulched site

Assumptions:

1. Entire area of 10 grids has been processed to a depth of 9 feet.
2. No hazardous substances beside radiological contamination will be encountered.
3. No components of the two abandoned north filter beds will be encountered, only soil will need to be processed.
4. Recent utility surveys performed for characterization activities are adequate for remediation and no other utilities will be found in the work area.
5. Work can be performed without any special regulatory requirements/restrictions due to proximity of the Big Darby Creek
6. Weather and ground water levels will not significantly affect the operations
7. IVC will be on-site or accept BCLDP final status results so backfilling can take place immediately upon receipt of BCLDP final status sample results

8. Production rates will be as follows: 5 days mobilization, soil removal 1296cf/day/crew = 5 days, 5 days backfill and demobilization.

Estimated Time to Plan the Work (Including Review and Approval): 20 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

None. Included under corresponding planning function.

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1 /20/20
Technical Advisors	HBTA	1/20/10
Project Manager/HP Manager	HBPM	2/20/80
Task Leader	HBTL	1/20/40
Secretary/Clerical	HBS	1/10/10
Support Professional	HBP	
Bartlett Health Physics	HRH	1/5/5

Estimated Time to Perform the Work: 15 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/15/20	N/A	
Project Manager/HP Manager	HBPM	2/15/60	N/A	
Task Leader	HBTL	1/15/120	0	15
Battelle Technician	HBT	1/15/15		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	1/15/20	N/A	
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	5/15/600	0	75
Bartlett Maint Specialist	HRDS	1/15/20	0	3
Bartlett Health Physics	HRH	2/15/240	0	30
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Excavation Subcontractor Operator = 120 hrs @ \$47.59/hr = \$5,711
- PC200 Excavator Rental = 15 rental days @ \$1792/wk = \$4,992
- Backfilling/Grading/Seeding = 225cy @ \$71.38/cy = \$16,061

Special Equipment/Material:**Comments/Explanations:**

1. The oil and gas line depth is 12 feet, is abandoned, and will not be removed or otherwise affected by the remediation work.
2. Intermittent water may be encountered in the process, however it will be allowed to dissipate back into the surrounding soil, removed and processed with the contaminated fluid, or pumped into a holding tank that will be sampled and free released. This will be an insignificant impact on the operation and waste volumes due to planned measures (protective coverings, weather forecasts, quick IVC release and backfilling) to address this issue.

Basis of Estimate:

What is the estimator's experience? 21 years in the nuclear design field for DOE contractors (13 years as project manager / engineering manager / baseline manager in the D&D field at various DOE sites). 7 years as BCLDP Building / Project Manager

What experience is directly related to BCLDP? 7 years as BCLDP Building / Project Manager

Did we apply a complexity factor during our thought process? yes, this is a straight forward process but involves changing operating parameters with different soil conditions.

Completed by: Cidney B. Voth/D Seifert

Date: 5/8/02

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I192

Work Pkg. No.: 7I2-B20

Function Name: Survey and Monitor the Abandoned North Filter Beds area after WIDE Demobilization

Component Name: Abandoned North Filter Bed

Function Description: After the WIDE system has been removed from the area, the Abandoned North Filter Beds will be surveyed and monitored to determine the effectiveness of the WIDE process.

Basis of Estimate

Strategy for Accomplishing Function: Previous characterization data for the abandoned north filter bed area will be used to guide the survey and monitoring process. It is estimated that 1/3 of the area will need to be completed to determine the WIDE system effectiveness.

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; RL-AP-1.0; QD-AP-4.1, 5.2, 6.1, 7.1; TD-AP-2.0

Input Descriptions:

1. Abandoned north filter bed area after WIDE system removal

Output Descriptions:

1. 59 gamma spectrum and 6 alpha isotopic samples
2. Data to report generation

Assumptions:

1. 33% of area will be surveyed.
2. Normal rate for walkover characterization surveys is 200 square meters per technician-hour
3. Bed Area N is 2 100 sq. m grids=45'x 25'x 6'=# samples=2x4x2x1/3=6 smpls; 1m;
4. Bed Area S is 4 100 sq. m grids=60' x40 x14'=# samples=4x4x2x1/3=11 smpls; 1m;
5. Bed Soil Samples 16 samples/d; 8 locations;16 smpls; 1d to sample
6. 5 % of total # exceeds DLV =0.05 x 17 = 1 to lab
7. 17 Bed Samples to Lab
8. Highest Depth Sample per Adjacent grid Bed N is (4) x10 gridsx1/3 = 14s to lab; 56 samples; 4d to samp.
9. Highest Depth Sample per Adjacent grid Bed S is 7x12 gridsx1/3=28 s to lab; 112 samples total; 7d samp.
10. 59 samples to lab total
11. The rate for characterization surveys includes: 5cm/sec survey rate, documentation, assess elevated levels>DLV, alpha,alpha+beta 2min counts required, perform smears.
12. 1 d for walkover survey
13. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
14. WI takes 24 hr to prepare/Safety Prof. 8hr for WI/SCL/6 Prof @ 2 hr For Rev/ Appr.
15. Initial Instrument Calibration 8hrs +10% time
16. No significant down time
17. Line Location 2 techs -2 days;1 tech 2 days to document; BCO Utilities 2 techs - 2 days to rev/appr

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 5 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	3/4/32
Technical Advisors	HBTA	3/3/20
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	1/1/8
Support Professional (Line Loc)	HBP	4/5/80
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 11 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1 / 11 / 22	NA	NA
Technical Advisors (Safety)	HBTA	1 / 11 / 11	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1 / 11 / 44	0	11
Battelle Technician (HP)	HBT	1 / 11 / 88	0	11
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	1 / 11 / 8		
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3 / 11 / 264	0	33
(Data)		1 / 11 / 11	NA	NA
		1 / 11 / 88	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience. 2 years at West Jefferson

Was a complexity factor used?

No, work is similar to that performed at KA

Completed by: P.J. Weaver

Date: 6/18/02

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I193

Work Pkg. No.: 7I4-B46

Function Name: Stabilize and Leave Sanitary Line Under Dam

Component Name: West Jeff External Areas

Function Description: Stabilization of the sanitary drain line underneath the dam to enable it to remain in place and not be removed during the BCLDP. See Battelle Drawing BM-WJ-1-16, Sheet 11 of 16, dated September 8-12-70, revised 8-3-84. Burgess & Niple Drawings H4, J4, H5, J5 and others dated September '79;

Basis of Estimate

Strategy for Accomplishing Function:. Approximately 205 linear feet (manhole to manhole) of 8 in VCP is contaminated and runs underneath the active dam and overlying road at the WJ north site. Traditional excavation and removal of this line is not preferable due to cost and safety factors. As an alternative, this drain line will be stabilized and left in place as described below:

- Identification/marketing of the drain line locations on the corresponding ground surface adjacent to the two man holes.
- Installation of sediment and barricade fences.
- Mechanical removal of soil to the appropriate depth to fully expose the drain line at both ends and create a level working area adjacent to the manholes.
- Installation of trench box for excavation protection.
- Mobilization of grouting equipment and supplies to the site.
- Injection of the grouting material (K-crete or something similar) into the drain lines.
- Verification of proper curing of the grouting material.
- Backfilling the excavations.
- Demobilization of equipment and other resources.

Applicable Requirements/Procedures:

BCLDP Volumetric Release Criteria; NRC Decommissioning Plan; ALARA Program; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0

Input Descriptions:

1. Radiological characterization data indicating contamination levels of the drainlines.
2. Equipment and qualified personnel resources ready to support the operations.
3. Rerouted sanitary line coming from JN-4.
4. Disabled/shut down sanitary line coming from the other WJ North buildings.

Output Descriptions:

1. Completed Work Instruction Data Package.
2. Job Control Waste volume=18 ft³
3. Fully stabilized 205 linear feet of drain line remaining in the ground.

Assumptions:

1. Depth of drain lines assumed to be 8 feet (From Battelle Facilities).
2. All soil assumed to be uncontaminated, no contaminated soil will be found during field screening above drain lines and no confirmatory analytical samples will be necessary.
3. Drain line will be in good condition and leaking of grout into the surrounding soil will not occur to a significant degree
4. No significant subsurface structures will be encountered and need to be moved to access the drainlines.
5. Utility surveys will be performed for preceding characterization activities and will be adequate for this work as well.
6. Weather and ground water levels will not significantly affect the operations

7. Natural run off (due to removal of storm drains) will be environmentally acceptable and not impact activities.
8. Production rates will be as follows: 20 LF/day/crew = 10 days

Estimated Time to Plan the Work (Including Review and Approval): 20 Days including purchased service contracting.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	1/20/24
Project Manager/HP Manager	HBPM	2/20/64
Task Leader	HBTL	1/20/64
Secretary/Clerical	HBS	
Support Professional	HBP	1/20/16
Bartlett Health Physics	HRH	1/5/5

Estimated Time to Perform the Work: 10 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/10/12	N/A	
Project Manager/HP Manager	HBPM	2/10/25	N/A	
Task Leader	HBTL	1/10/62	0	10
Battelle Technician	HBT	1/10/8	0	10
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	1/10/8	N/A	
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	2/10/160	0	20
Bartlett Maint Specialist	HRDS	1/10/16	0	10
Bartlett Health Physics	HRH	2/10/160	0	20
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Grout pipe under Dam = \$7,773

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks

Did we apply a complexity factor during our thought process? Yes, the mechanical contractor who supplied the estimate is familiar with working in a radiological environment and took this into consideration when preparing his estimate.

Completed by: Scott R. Brown

Date: 6/11/02

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I195

Work Pkg. No.: 7I2-B13

Function Name: Survey and Monitor Sanitary Sewer Lines

Component Name: Sanitary Sewer Lines

Function Description: Baseline Characterization Sanitary Sewer Lines

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04, 05; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0, 2.0, 5.0; HP-OP-012; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. Background levels of radiation must be low to correctly assess background
2. 2916 ft of storm & sanitary sewer lines present(Given in I196)
3. 80% of the lines are above release criteria

Output Descriptions:

1. Establish background for each material
2. Establish Decision Level Values (DLVs) for each material
3. 320 gamma spectrum samples
4. 33 alpha isotopic samples
5. Data to report generation

Assumptions:

Establish material background & DLVs

1. 3 types of materials exist in 4 quadrants
2. (40) 1 minute measurements for alpha + beta window per material
3. (40) 1 minute measurements for alpha window per material
4. 3 minute prep/setup/taking floor & lower level wall readings(100%) = 48 hrs
5. 1.25 hr to establish DLV for each material (spreadsheet) =16 hrs

Survey

1. Sample locations @ intervals of 1m
2. Samples will be taken at the surface and @ 1m on the floor or the trench.
3. Sampling rate is 2 samples per hour or 16 s /d
4. $2916\text{ft} \times 0.3048\text{m/ft} \times 0.8 = 711\text{ m}$ to be monitored $\times 2\text{ samples/l} = 1422\text{s}$
5. $1422\text{s}/16\text{s/d} = 89\text{ d}$
6. # samples to lab = 10% total = 142 s; 15 alpha spec
7. 20% of pipe assumed clean
8. Sample at 5 m location intervals to a depth of 12 m
9. $2916\text{ ft} \times 0.3048\text{ m/ft} \times 0.2 = 178\text{ m}$
10. Sample @ 5 m intervals $= 178/5 = 36\text{ locations}$
11. 36 locations to a depth of 4m

12. $361 \times 5s/l = 180 \text{ s}/16s/d=11d$
13. $180 = 180s \text{ to lab}; 18 \text{ alpha spec}$
14. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
15. WI takes 24 hr to prepare/Safety Prof. 8hr for WI/SCL/6 Prof @ 2 hr for Rev/Appr.
16. Line Loc 2x normal rate
17. Calibration – 8 Hr +10% time
18. See Assump.11; D006
19. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 10 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	3/4/32
Technical Advisors	HBTA	3/3/20
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	1/1/8
Support Professional (Line Loc)	HBP	4/10/160
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 100 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/100/200	NA	NA
Technical Advisors (Safety)	HBTA	1/100/100	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/100/400	0	100
Battelle Technician (HP)	HBT	1/100/800	0	100
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			

Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/100/2113	0	600
(Data)		1/100/14	NA	
		1/100/794	NA	
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to that performed at KA

Completed by: J.F. POLIZIANI

Date: 6/20/02

Rev. No.: 1

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I196

Work Pkg. No.: 7I4-B46

Function Name: Remediate Sanitary Sewer Lines

Component Name: West Jeff External Areas

Function Description: Remediation of radioactively contaminated sanitary sewer drains in the external areas of the BCLDP West Jefferson North Site. See Battelle Drawing BM-WJ-1-16, Sheet 11 of 16, dated September 8-12-70, revised 8-3-84. Burgess & Niple Drawings H4, J4, H5, J5 and others dated September '79;

Basis of Estimate

Strategy for Accomplishing Function: After all site utilities have been relocated to service JN-4 (non-BCLDP building), and remaining utilities disabled, removal of the subject drainlines will take place. This activity covers drain line removal up to the manhole (# 4 from the Pipe Explorer Report) on the west side of the dam, prior to the road. Multiple crews will be mobilized and the following will be accomplished:

- Identification/marketing of the drainline location on the corresponding ground surface.
- Installation of sediment and barricade fences
- Mechanical removal of soils overlying the drainlines through use of an excavator. Any non-drain utilities encountered in the path will be removed also during this process (mechanically supplemented by hand). Their volume is included in the soil volume and accounted for in the soil removal production rate.
- Soil above the drain lines will be field screened periodically by characterization/HP personnel.
- Mechanical excavation will be halted as drainlines are encountered. Trench boxes will be installed in the trenches if necessary, crews will enter the trenches, carefully remove surrounding soil to fully expose the drainlines, and remove the drain lines in small (2-3 ft) segments. The drain segments will be appropriately emptied, packaged, transported out of the trench, and transferred to BCLDP Waste Management. BCLDP Waste Management will then process the segments for disposal (not addressed in this function).
- Eleven manholes will be removed through a combination of mechanical and hand operations.
- Underlying areas of contaminated soil will then be removed based on radiological characterization survey results
- The trenches will be covered and appropriately protected from weather and other elements that may harm their integrity.
- Uncontaminated soil will be staged for backfilling purposes.

Applicable Requirements/Procedures:

BCLDP Volumetric Release Criteria; NRC Decommissioning Plan; ALARA Program; DD-90-02; BCLDP-90-1; DD-93-03, 04, 05; DD-OP-029; HP-AP-1.0, 2.0, 5.0, 8.0, 29.0; HP-OP-011, 012, 019, 106; HS-AP-2.0, 4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SC-AP-004.2; SIH-PP-08; SM-OP-001; TD-AP-2.0, 3.0

Input Descriptions:

1. Radiological characterization data indicating contamination levels of the drainlines.
2. Equipment and qualified personnel resources ready to support the operations.
3. Rerouted utilities in place servicing JN-4
4. Disabled utilities remaining in the WJ North grounds that may be impacted by this operation.

Output Descriptions:

1. Completed Work Instruction Data Package
2. Contaminated drain lines (3-8 in. vitrified clay, cast iron). Total volume = 2333 LF drain line
3. Contaminated soil under drain lines = 2100 cu ft
4. RAL samples=8 gamma spec and 1 alpha isotopic samples
5. Job Control Waste volume=372 cu ft
6. Trenches ready for Final status survey and IVC.

Assumptions:

1. Depth of drain lines assumed to be 8 feet (From Battelle Facilities).
2. 80% of external areas sanitary sewer drain lines (not including Abandoned North Filter Bed Area, Old Middle Filter Bed Area, Active North Filter Bed Area, Run Underneath the Dam Between Two Manholes) assumed to be contaminated and needing removal
3. 10% of area underneath drain line will be contaminated in a 3 ft x 3ft area.
4. No hazardous soil beside radiological contamination will be encountered.
5. No contaminated soil will be found during field screening above drain lines and no confirmatory analytical samples will be necessary.
6. The manholes will not be contaminated and can be free released and disposed of as regular waste.
7. No significant subsurface structures will be encountered and need to be moved to access the drainlines.
8. The structures of buildings (they may be removed by this point) will not be impacted by this operation.
9. Utility surveys will be performed for preceding characterization activities and will be adequate for this work as well.
10. Weather and ground water levels will not significantly affect the operations
11. Natural run off (due to removal of storm drains) will be environmentally acceptable and not impact activities.
12. Production rates will be as follows: Drain line-Contaminated Soil-Manhole Removal (2333LF)- 8LF/day/crew, 5 crews/day = 40 lf/day = 58 days

Estimated Time to Plan the Work (Including Review and Approval): 20 Days including purchased service contracting.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	2/20/64
Project Manager/HP Manager	HBPM	2/20/64
Task Leader	HBTL	1/20/64
Secretary/Clerical	HBS	
Support Professional	HBP	1/20/16
Bartlett Health Physics	HRH	1/5/5

Estimated Time to Perform the Work: 58 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1/58/70	N/A	
Project Manager/HP Manager	HBPM	2/58/140	N/A	
Task Leader	HBTL	1/58/350	0	58
Battelle Technician	HBT	1/58/47	0	58

Battelle Technician O/T	HBT0			
RAL Staff	HBL			
Support Professional	HBP	1/58/47	N/A	58
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	10/58/4666	0	580
Bartlett Maint Specialist	HRDS	1/58/93	0	58
Bartlett Health Physics	HRH	13/58/5832	0	754
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Excavation Subcontractor Operator = 2320 hrs @ \$47.59/hr = \$110,409
- TB070 Excavator Rental = 290 machine days @ \$3331/month = \$49,436
- Trench Box Rental = 290 machine days @ \$1058/month = \$15,764

Comments/Explanations:

1. All utilities in the work area will be disabled and will be removed (mechanically or by hand) if they are present in the drainline trenches.
2. The oil and gas line depth is 12 feet, is abandoned, and will not be removed or otherwise affected by the remediation work.
3. Intermittent water may be encountered in the excavations, however it will be allowed to dissipate back into the surrounding soil, or pumped into 55-gallon drums that will be sampled and free released. This will be an insignificant impact on the operation and waste volumes due to planned measures (protective coverings, weather forecasts, quick IVC release and backfilling) to address this issue.
4. This work will take place near the end of the entire project, so no alternative rerouting of the drains for the site (with the exception of JN-4) will be necessary.
5. Final status surveys and IVC release, and subsequent backfilling of the drain trenches are not included here. The operational importance of the timeliness of these activities is not the same as for the filter bed removal activities.

Basis of Estimate:

What is the estimator's experience? 18 years in the environmental field

What experience is directly related to BCLDP? 12 years in the BCLDP, 8 years specifically managing building and external areas remediation tasks

Did we apply a complexity factor during our thought process? Yes, production rates & crew size were based on other external area drain line removal efforts (abandoned north filter beds), but reduced 25% to account for some co-located utilities and increased volume of contaminated soil under the drain lines. Reduced another >25% to account for removal of manholes.

Completed by: Scott R. Brown (rvwd-DAS)

Date: 6/13/02

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I197

Work Pkg. No.: 7I4-B47

Function Name: Perform Sanitary Sewer Lines Completion Survey

Component Name: Sanitary Sewer Lines

Function Description: Completion Survey of Sanitary Sewer Lines

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"; "Establishing a Surface Reference Grid for Walls, Floors, and Ceilings for a Detailed Characterization Survey"; "Facility Post-Decontamination Final Status Survey for Baseline Areas"; DD-90-02; DD-93-04; DD-97-02; DD-CP-002, 004, 010, 030; HP-AP-1.0; HP-AP-2.0; HP-AP-5.0; HP-OP-012; HS-AP-2.0; HS-AP-4.0; HS-AP-5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2; QD-AP-6.1; RL-AP-1.0; TD-AP-2.0

Input Descriptions:

1. 2916 ft of sanitary sewer lines present(Given in I196)
2. 80% of the lines are above release criteria

Output Descriptions:

1. 98 gamma spectrum samples
2. 10alpha isotopic samples
3. Data to report generation

Assumptions:

1. 10% of all locations assumed contaminated; needing resampled
2. Sample locations @ intervals of 1m
3. Samples will be taken at the surface and @ 1m on the floor or the trench.
4. Sampling rate is 2 samples per hour or 16 s /d
5. $2916\text{ft} \times 0.3048\text{m/ft} \times 0.8 = 711\text{ m}$ to be monitored $\times 2\text{ samples/l} = 1422\text{s} \times 0.1 = 142$
6. $142\text{s}/16\text{s/d} = 9\text{ d}$
7. # samples to lab = 10% total+30 = 44 s; 4 alpha spec; 10% redo=4 gamma spec; 1 alpha spec
8. 20% of pipe assumed clean
9. Sample at 5 m location intervals to a depth of 12 m
10. $2916\text{ ft} \times 0.3048\text{ m/ft} \times 0.2 = 492\text{ m}$
11. Sample @ 5 m intervals = $492/5 = 98\text{ locations} \times 0.1 = 10\text{ loc.}$
12. 10 locations to a depth of 4m = 50s
13. $50\text{ s}/16\text{s/d} = 3\text{d}$
14. 50s total; , 100% to lab 50s gamma spec; 5 alpha spec
15. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
16. WI under I195
17. Calibration – 10% time
18. No significant down time

Data Technician:

1. Technician inputs data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background

Estimated Time to Plan the Work (Including Review and Approval): 0 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional (Line Loc)	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 12 work days for survey & sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/12/24	NA	NA
Technical Advisors (Safety)	HBTA	1/12/10	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/12/48	0	12
Battelle Technician (HP)	HBT	1/28/104	0	12
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional (Lift)	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments)	HRH	3/12/289	0	72
(Data)		1/12/10	NA	
		1/12/96	NA	
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to that performed at KA

Completed by: J.F. POLIZIANI

Date: 6/20/02

Rev. No.: 1

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: I198

Work Pkg. No.: 7I4-B64

Function Name: Develop JN-4 Isolation Plan

Component Name: West Jeff External Areas

Function Description: Detailed engineering specifications will be developed by a competent engineering firm in consultation with BCO Facilities and the BCLDP for providing alternate utilities to Building JN-4 so that those impacted by the BCLDP can be removed. The impact of contaminated areas/utility lines will be minimized during the project design based on contamination surveys, utility location maps, and consultations with BCLDP and BCO Facilities staff.

Basis of Estimate

Strategy for Accomplishing Function: An engineering design contract will be negotiated to provide detailed specifications and plans for the relocation of utilities to JN-4.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04, 05; HP-AP-1.0, 2.0, 5.0; HS-AP-2.0, 4.0, 5.0; PR-AP-17.1; QD-AP-3.2, 4.1, 7.1, 10.1; TD-AP-2.0

Input Descriptions:

1. An engineering design contract resulting from competitive bids from competent engineering firms.
2. Radiological characterization data indicating the locations of specific piping and soil/road areas requiring radiological remediation that would impact the isolation design.

Output Descriptions:

1. Detailed engineering designs and specifications for rerouting of water, sewer, communication, and pedestrian/vehicle access to Building JN-4.

Assumptions:

1. Current estimate based on review of available utility diagrams and general rerouting plans. Records will be examined again at time of work for use in detailed identification and design.
2. Affected utilities will include communication lines, natural gas, sanitary sewer from and softened water supply to JN-4 due to their location or intersection with contaminated drains and soil.
3. No significant subsurface structures will be encountered and need to be moved to install utilities.
4. Natural run off (due to removal of storm drains) will be environmentally acceptable and alternative arrangements will not need to be made. This is the current arrangement
5. Active North Filter Bed will remain in service
6. Excavated soil will be used for backfilling purposes
7. Alternative utility installation will take place in uncontaminated soil, although some HP monitoring may be required

Estimated Time to Plan the Work (Including Review and Approval): 20 days for contract bid and award.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

None. Included under corresponding planning function.

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1/1/2
Technical Advisors	HBTA	1/2/4
Project Manager/HP Manager	HBPM	1/20/8
Task Leader	HBTL	
Secretary/Clerical	HBS	1/1/4
Support Professional	HBP	
Bartlett Health Physics	HRH	
BCO Support	HBCO	2/20/20

Estimated Time to Perform the Work: 40 days.

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA			
Project Manager/HP Manager	HBPM	1/40/16		
Task Leader	HBTL			
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO	2/40/80		
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF	2/40/20		
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH			
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

- Principal Engineer/Manager: 32 hr @ \$174.49 = \$5,584
- Design Engineer: 160 hr @ \$126.90 = \$20,304
- CADD Operator: 240 hr @ \$84.60 = \$20,304

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? Twenty years experience in planning and conduct of government and industrial R&D projects at Battelle

What experience is directly related to BCLDP? Ten years of direct BCLDP experience planning and managing Remedial Action activities including material & utility removal, decontamination, excavation and drain removal, and asbestos abatement

Did we apply a complexity factor during our thought process? No.

Completed by: D. A. Seifert

Date: 6/24/02

Rev. No.: 0

FY 03 ☒ FY 04 ☒ FY 05 ☒ FY 06

Activity Number: I200

Work Package Number: 7I4--B67

Function Name: Obtain and Install New Locker Facilities

Component Name: Relocation of the West Jefferson Locker Facilities

Function Description: A modular office type unit will be leased and set up to house the personnel locker facilities from the time Building JN-3 is converted to a de-energized building in preparation for demolition until all radiological controlled work is completed at the West Jefferson site. The facility will feature running water and bathrooms as well as 40 lockers (80 half lockers) for men and 10 lockers (20 half lockers) for women.

Basis of Estimate

Strategy for Accomplishing Task: Acquire a modular unit for a West Jefferson locker facility with functions that adequately support operations and that cost effectively accommodates a range of D&D planning options

Applicable Requirements/Procedures:

1. OSHA for temporary facilities

Input Descriptions:

1. Received technical and costing input from Facility Operations personnel.

Output Descriptions:

1. Relocated JN-3 locker facilities.
2. Locker facilities that adequately support all radiological control aspects of the D&D operation.

Assumptions:

1. Estimates based on a quoted lease option and continual scope of work

Estimated Time to Plan the Work (Including Review and Approval):

1. Planning to include project personnel and personnel to coordinate--10 hours

Estimated Resources Required to Plan the Work: 20 days

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	N/A
Technical Advisors	HBTA	N/A
Project Manager/HP Manager	HBPM	2 / 10 / 40
Task Leader	HBTL	1 / 10 / 20
Secretary/Clerical	HBS	N/A
Support Professional	HBP	1/ 10 / 10
Bartlett Health Physics	HRH	N/A
BCO Skilled Laborer	HCE	N/A

Estimated Time to Perform the Task: 40 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; e.g., 4/20/640

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA		N/A	N/A
Manager/Senior Staff	HBB		N/A	N/A
Technical Advisors	HBTA	1/40/40	N/A	N/A
Project Manager/HP Manager	HBPM	2/40/320	N/A	N/A
Task Leader	HBTL	1/40/160	N/A	N/A
Battelle Technician	HBT		N/A	N/A
Battelle Technician O/T	HBTO		N/A	N/A
RAL Staff	HBL		N/A	N/A
Support Professional	HBP	1/ 40/ 120	N/A	N/A
Secretary/Clerical	HBS		N/A	N/A
Decon Ops Hourly	HBH		N/A	N/A
BCO Support	HBCO		N/A	N/A
BCO Skilled Laborer	HCE		N/A	N/A
BCO Skilled Laborer O/T	HCEO		N/A	N/A
BCO Facility Manager	HCF		N/A	N/A
Bartlett Technician	HRD		N/A	N/A
Bartlett Maint Specialist	HRDS		N/A	N/A
Bartlett Health Physics	HRH	1/40/8	N/A	N/A
Bartlett Admin Support	HRA		N/A	N/A

Subcontract/Purchased Service: With escalation

1. Electric service from JN-4 substation (\$20,000) plus transformer (\$6,000) = \$26,000
2. Gas Service (trench 150' Means) = \$2,165
3. Communications (JN1 Manhole new trench and manhole Means) = \$15,000
4. Lease at \$650/month (36 Mo) + Deliveries/Exit \$6082 = \$31,378
5. Foundations, Set, Anchor, Seam, Ramp, Skirt = \$29,010
6. Configuration modifications allow \$20,000
7. Water and sewer (100' – trench with gas service) = \$3000

Special Equipment/Material:

Comments/Explanations: Very few items identified for relocation – just clothing racks and shelves

Basis of Estimate:

What is the estimator's experience? 21 years in the nuclear design field for DOE contractors (13 years as project manager / engineering manager / baseline manager in the D&D field at various DOE sites).

What experience is directly related to BCLDP? 7 years as BCLDP Building / Project Manager

Did we apply a complexity factor during our thought process? No, this is a straight forward process.

Completed by: Cid Voth

Date: 06/28/02

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: IG002

Work Pkg. No.: 7I4-B65

Function Name: Monitoring of wells and data analysis

Component Name: Groundwater plan

Function Description: Data from all wells will be trended and interpreted in order to detect changes in the groundwater flow system throughout the remainder of the project. Continuous interpretation of the flow system is necessary to monitoring potential migration of contaminants that may be inadvertently released during demolition of buildings and to track the effectiveness and effects of the dewatering systems around JN-3 and JN-1.

Basis of Estimate

Strategy for Accomplishing Function: Water level measurements and water quality samples will be collected and analyzed according to project procedures. Data in both raw form and converted to hydraulic parameters will be entered into a 3-dimensional database and visualized for hydrogeologic analysis.

Applicable Requirements/Procedures:

- 1) Sampling of monitoring wells 2) Water level measurements from monitoring wells

Input Descriptions:

- Monthly field measurements from wells, seeps and the lake

Output Descriptions:

- 111 RGAMMA and 111 RGROSS samples for RAL
- Monthly reports of the groundwater flow system at the North Site
- Monthly water level maps and 3-D visualizations
- Water quality report

Assumptions:

- Water levels in all wells will be measured monthly

Estimated Time to Plan the Work (Including Review and Approval): N/A

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 1100 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	136		
Project Manager/HP Manager	HBPM	136		
Task Leader	HBTL			
Battelle Technician	HBT	816+136		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	34+204+816+1020+34+240		
Secretary/Clerical	HBS	68		
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Special Project	HCF	1632		
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS	136		
Bartlett Health Physics	HRH	120		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: 111 Offsite chemical analysis @\$718.92 = \$79,800

Special Equipment/Material: N/A

Comments/Explanations: ---

Basis of Estimate:

What is the estimator's experience? 25 years analyzing groundwater flow systems

What experience is directly related to BCLDP? Groundwater support to project since 1988

Did we apply a complexity factor during our thought process? No

Completed by: Tom Naymik

Date: 6/8/2002

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: IG003

Work Pkg. No.: 7I4-B66

Function Name: Install water discharge/containment system for pumped water

Component Name: Groundwater plan

Function Description: The containment system will hold water from JN-3 and JN-1 dewatering systems on a temporary basis until it has analyzed. Uncontaminated water will be discharged through a pipeline to the lake

Basis of Estimate

Strategy for Accomplishing Function: 1) Maintain simple and flexible design--dewatering during excavation of the foundations will be modified periodically. 2) Maintain gravity drainage system, 3) Design to avoid freezing and blockage, 4) Base design on aquifer testing flow rates, 5) Incorporate discharge system flow meter

Applicable Requirements/Procedures: Procedures for BCLDP worker safety

Input Descriptions:

- Holding tanks/pools
- Smaller mobile tanks for localized dewatering
- PVC pipe, couplings, plumbing materials, etc.

Output Descriptions:

- Above ground holding tank/pool(s)
- Piping system with discharge to the lake

Assumptions:

- Elevation of land surface will allow the system to gravity drain eliminating the need to force pump water to the lake

Estimated Time to Plan the Work (Including Review and Approval): N/A

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 20 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	16		
Project Manager/HP Manager	HBPM	16		
Task Leader	HBTL			
Battelle Technician	HBT	160 + 80		
Battelle Technician O/T	HBTOT			
RAL Staff	HBL			
Support Professional	HBP	4		
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	80		
BCO Skilled Laborer O/T	HCEO			
BCO Special Project	HCF	60		
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS	40		
Bartlett Health Physics	HRH			
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material: Holding tank(s) for \$5,000.

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 25 years of experience around pump and treat systems

What experience is directly related to BCLDP? Groundwater support since 1988

Did we apply a complexity factor during our thought process? No

Completed by: Tom Naymik

Date: 6/8/2002

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: IG004

Work Pkg. No.: 7I4-B66

Function Name: Install 10 pits into 885 layer

Component Name: Groundwater plan

Function Description: Pits will be dug along the north and east sides of the site to intersect the 885 sand. Seepage of groundwater along the sides of the pit will allow for groundwater sampling of the unit. The seep water will be analyzed for chemical constituents. Soil logging and groundwater monitoring will be less expensive than drilling wells.

Basis of Estimate

Strategy for Accomplishing Function: 1) Backhoe digging guided by elevation measurements, 2) Hand digging/scraping with shovels to clean off pit wall for geologic logging

Applicable Requirements/Procedures: Project worker safety procedures

Input Descriptions:

- Rented backhoe and trenching services
- Hand held excavation tools

Output Descriptions:

- 40 RGAMMA and 40 RGROSS samples for RAL
- Analysis of seep water samples from the 885 sand
- Geologic logs of previously unknown areas
- Report of Pit Excavations

Assumptions:

- Weather during this time frame will allow for digging and sampling (little rain)

Estimated Time to Plan the Work (Including Review and Approval): N/A

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 160 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 *Group 1 160*

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	40		
Project Manager/HP Manager	HBPM			
Task Leader	HBTL			
Battelle Technician	HBT	40		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	5+100+100+5+20+40		
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Special Project	HCF	200		
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS	40		
Bartlett Health Physics	HRH	100 + 40		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Trenching service for \$9,518 and 10 offsite chemical analysis for \$7,189. Ground level survey in pit locations prior to digging, \$1000.

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? 25 years as a professional geologist

What experience is directly related to BCLDP? Project support since 1988

Did we apply a complexity factor during our thought process? No

Completed by: Tom Naymik

Date: 6/8/2002

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: IG005

Work Pkg. No.: 7I4-B66

Function Name: Install 3 basal sand wells and two additional JN-3 dewatering wells

Component Name: Groundwater plan

Function Description: 1) Basal wells will yield water levels in the basal sand allowing the direction of groundwater flow to be determined, 2) Measured hydraulics of the basal sand and water quality measurements will ensure that Battelle has bounded any potential contamination that may be present or that may result during demolition.

Additional dewatering wells will be added to the existing system of 4 wells in strategic locations based on aquifer testing.

Basis of Estimate

Strategy for Accomplishing Function: 1) Subcontract to drill and construct wells, 2) Sample wells for water quality, 3) Connect additional dewatering wells to the retention/discharge system, 4) Test all new wells, 5) Determine enhancements/improvements in the dewatering around JN-3.

Applicable Requirements/Procedures: Project worker safety procedures

Input Descriptions:

- Drilling new wells
- Test of wells
- Connect dewatering wells to containment system

Output Descriptions:

- 100 RGAMMA and 100 RGROSS samples for RAL
- 5 new wells
- Report of drilling, logging and testing
- Report of chemical analysis

Assumptions:

- Weather during this timeframe allows for completion of the construction activities

Estimated Time to Plan the Work (Including Review and Approval): N/A

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 20 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 *Group 1 160*

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	35		
Project Manager/HP Manager	HBPM	35		
Task Leader	HBTL			
Battelle Technician	HBT	64+35		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	4 + 24+80+80+4+20		
Secretary/Clerical	HBS	2		
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Special Project	HCF	120		
Bartlett Technician	HRD	80		
Bartlett Maint Specialist	HRDS	35		
Bartlett Health Physics	HRH	80+20		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Well installation for \$55,518 and 5 offsite chemical analysis for \$3,595

Special Equipment/Material:

Comments/Explanations: ---

Basis of Estimate:

What is the estimator's experience? 25 years of well installation supervision

What experience is directly related to BCLDP? Well installation support since 1988

Did we apply a complexity factor during our thought process? NO

Completed by: Tom Naymik

Date: 6/6/2002

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: IG006

Work Pkg. No.: 7I4-B66

Function Name: Perform JN-3 pilot dewatering tests and Geoprobe borings

Component Name: Groundwater plan

Function Description: Optimize JN-3 dewatering through pilot testing and borehole drainage enhancements

Basis of Estimate

Strategy for Accomplishing Function: 1) Conduct pilot testing configurations for dewatering, 2) Drill geoprobe borings and conduct pilot testing and groundwater measurements as boreholes are being made, 3) After completion of geoprobe borings conduct pilot testing

Applicable Requirements/Procedures: Project worker safety procedures

Input Descriptions:

- Pumping rate configurations
- Geoprobe borings

Output Descriptions:

- 200 RGAMMA and 200 RGROSS samples to RAL
- Report of Pilot Testing Results and Optimization

Assumptions:

- Several Geoprobe borings can be drilled around JN-3 to potentially make an impact for downward drainage of groundwater

Estimated Time to Plan the Work (Including Review and Approval): N/A

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 100 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	40		
Project Manager/HP Manager	HBPM	40		
Task Leader	HBTL			
Battelle Technician	HBT	40		
Battelle Technician O/T	HBTOT			
RAL Staff	HBL			
Support Professional	HBP	5+240+240+5		
Secretary/Clerical	HBS	5		
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Special Project	HCF	480		
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH	200 + 20		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Well installation \$31,725

Special Equipment/Material: Geoprobe

Comments/Explanations: ---

Basis of Estimate:

What is the estimator's experience? 25 years testing pump and treat systems

What experience is directly related to BCLDP? Project support since 1988

Did we apply a complexity factor during our thought process? No

Completed by: Tom Naymik

Date: 6/8/2002

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: IG007

Work Pkg. No.: 7I4-B65

Function Name: Dewatering of JN-3

Component Name: Groundwater plan

Function Description: Depressurize and lower groundwater around the foundation of JN-3 to reduce/eliminate water problems during excavation of the foundation

Basis of Estimate

Strategy for Accomplishing Function: Install, test, and operate a network of 6 dewatering wells around JN-3, 2) discharge water to the lake

Applicable Requirements/Procedures: Project safety and M/O procedures

Input Descriptions:

- Dewatering system installed in other work packages
- Staff time for water level measurements
- Staff to maintain the system
- System modifications
- Optimization of system
- System repairs

Output Descriptions:

- 6 RGROSS and 6 RGAMMA samples to RAL
- Monthly reports of dewatering system performance

Assumptions:

- none

Estimated Time to Plan the Work (Including Review and Approval): N/A

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 450 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	32		
Project Manager/HP Manager	HBPM	32		
Task Leader	HBTL			
Battelle Technician	HBT	640 + 32		
Battelle Technician O/T	HBTO			
RAL Staff	HLB			
Support Professional	HBP	640+640+16+36		
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	Electrician 32		
BCO Skilled Laborer O/T	HCEO			
BCO Special Project	HCF	1280		
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS	32		
Bartlett Health Physics	HRH			
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: 6 Offsite chemical analysis \$4,314

Special Equipment/Material: N/A

Comments/Explanations: ----

Basis of Estimate:

What is the estimator's experience? 25 years of monitoring pumping systems

What experience is directly related to BCLDP? Support since 1988

Did we apply a complexity factor during our thought process? No

Completed by: Tom Naymik

Date: 6/6/2002

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: IG008

Work Pkg. No.: 7I4-B66

Function Name: Install two 855 downgradient wells, five downgradient 885 wells and the JN-1 three-well cluster

Component Name: Groundwater plan

Function Description: 1) 855 downgradient wells will ensure that no potential migration will occur through that pathway, 2) 885 downgradient wells will ensure no potential migration through that sand unit, 3) JN-1 cluster will yield measurements of vertical head difference between the water-bearing units near JN-1 necessary for the dewatering system design and operation

Basis of Estimate

Strategy for Accomplishing Function: 1) Drill, construct, test wells, 2) Sample for water quality and make several water level measurements

Applicable Requirements/Procedures: Project safety procedures, testing procedures, and sampling procedures

Input Descriptions:

- Drilling of wells
- Testing and sampling

Output Descriptions:

- 100 RGAMMA and 100 RGROSS samples to RAL
- 10 wells
- Well installation report
- Drilling logs
- Water quality report

Assumptions:

- Weather allows drilling and installation to be completed during this timeframe

Estimated Time to Plan the Work (Including Review and Approval): N/A

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 40 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	35		
Project Manager/HP Manager	HBPM	35		
Task Leader	HBTL			
Battelle Technician	HBT	80 + 35		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	2+8+160+160+2+20		
Secretary/Clerical	HBS	2		
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Special Project	HCF	280		
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS	35		
Bartlett Health Physics	HRH	120 + 20		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Well installation \$66,094 and 10 offsite chemical analysis \$7,189

Special Equipment/Material: N/A

Comments/Explanations: ---

Basis of Estimate:

What is the estimator's experience? 25 years supervising well installations

What experience is directly related to BCLDP? Since 1988

Did we apply a complexity factor during our thought process? No

Completed by: Tom Naymik

Date: 6/8/2002

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: IG009

Work Pkg. No.: 7I4-B66

Function Name: Install at JN-1: six 885 and four 855 dewatering wells

Component Name: Groundwater plan

Function Description: 1) 885 dewatering wells (6) will pump the groundwater out of the 885 sand while working on JN-1, 2) The 855 dewatering wells will pump the groundwater out of the 855 sand around JN-1

Basis of Estimate

Strategy for Accomplishing Function: 1) Drill, construct and test wells, 2) Install submersible pumps in all 10 wells, 3) Connect pump discharge lines to the containment/discharge system developed for JN-3, 4) Make several water level measurements

Applicable Requirements/Procedures: Project safety, water level measurements, water quality sampling procedures

Input Descriptions:

- Drilling of 10 wells
- Testing and water sampling

Output Descriptions:

- 100 RGAMMA and 100 RGROSS samples for RAL
- 10 wells
- Well Installation Report
- Drilling logs
- Water quality report

Assumptions:

- Weather will allow drilling and installation to be completed during this time frame.

Estimated Time to Plan the Work (Including Review and Approval): N/A

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 40 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	35		
Project Manager/HP Manager	HBPM	35		
Task Leader	HBTL			
Battelle Technician	HBT	80+35		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	2 +16+140+140+2+20		
Secretary/Clerical	HBS	2		
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Special Project	HCF	280		
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS	35		
Bartlett Health Physics	HRH	120 + 20		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Well installation \$127,958 and 10 offsite chemical analysis \$7,189

Special Equipment/Material: N/A

Comments/Explanations: ----

Basis of Estimate:

What is the estimator's experience? 25 years supervising well installations

What experience is directly related to BCLDP? Drilling and well construction since 1988

Did we apply a complexity factor during our thought process? No

Completed by: Tom Naymik

Date: 6/8/2002

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: IG010

Work Pkg. No.: 7I4-B66

Function Name: Perform JN-1 pilot dewatering tests and Geoprobe borings

Component Name: Groundwater plan

Function Description: Optimize JN-1 885 dewatering system through pilot testing and borehole drainage enhancements. Secondly, optimize the 855 sand component of the system.

Basis of Estimate

Strategy for Accomplishing Function: 1) Conduct pilot testing configurations for dewatering, 2) Drill geoprobe borings and conduct pilot testing and groundwater measurements as boreholes are being made, 3) After completion of Geoprobe borings conduct repeated pilot testing, 4) Pilot test the 855 sand subsystem.

Applicable Requirements/Procedures: Project worker safety procedures

Input Descriptions:

- Pumping rate configurations
- Geoprobe borings

Output Descriptions:

- 200 RGAMMA and 200 RGROSS samples for RAL
- Report of Pilot Testing Results and Optimization

Assumptions:

- Several Geoprobe borings can be drilled around JN-1 to potentially make an impact for downward drainage of groundwater from the 885 sand

Estimated Time to Plan the Work (Including Review and Approval): N/A

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 60 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	40		
Project Manager/HP Manager	HBPM	40		
Task Leader	HBTL			
Battelle Technician	HBT	70 + 40		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP	3+16+190+190+3+20		
Secretary/Clerical	HBS	3		
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Special Project	HCF	380		
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS	40		
Bartlett Health Physics	HRH	200 +20		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Well installation \$31,725 and 5 offsite chemical analysis \$3,595

Special Equipment/Material: Geoprobe

Comments/Explanations: ---

Basis of Estimate:

What is the estimator's experience? 25 years of pump and treat system testing

What experience is directly related to BCLDP? Project support since 1988

Did we apply a complexity factor during our thought process? No

Completed by: Tom Naymik

Date: 6/8/2002

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: IG011

Work Pkg. No.: 7I4-B65

Function Name: JN-1 dewatering

Component Name: Groundwater plan

Function Description: Depressurize and lower groundwater levels in both the 885 and 855 sands around the foundation of JN-1 to reduce/eliminate water problems during excavation of the foundation and mainly the pool

Basis of Estimate

Strategy for Accomplishing Function: Install, test, and operate a network of 10 dewatering wells around JN-1, 2) Modify and expand the capacity of the JN-3 dewatering system, 3) Discharge water to the existing containment/discharge system that was constructed for JN-3

Applicable Requirements/Procedures: Project safety and M/O procedures

Input Descriptions:

Piping to connect wells to the JN-3 dewatering discharge lines

- System modifications
- Optimization of the system
- System repairs

Output Descriptions:

- Monthly reports of dewatering system performance

Assumptions:

- none

Estimated Time to Plan the Work (Including Review and Approval): N/A

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 850 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	48		
Project Manager/HP Manager	HBPM	48		
Task Leader	HBTL			
Battelle Technician	HBT	576 + 48		
Battelle Technician O/T	HBTO			
RAL Staff	HLB			
Support Professional	HBP	40+288+576+12+36		
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Special Project	HCF	1152		
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS	49		
Bartlett Health Physics	HRH			
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: 10 Offsite chemical analysis \$7,189

Special Equipment/Material: N/A

Comments/Explanations: -----

Basis of Estimate:

What is the estimator's experience? 25 years of monitoring pumping systems

What experience is directly related to BCLDP? Support to project since 1988

Did we apply a complexity factor during our thought process? No

Completed by: Tom Naymik

Date: 6/8/2002

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☒ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: IG012

Work Pkg. No.: 7I4-B66

Function Name: Disposition and abandonment of wells and discharge/containment system

Component Name: Groundwater plan

Function Description: When BCLDP D&D is considered complete by IVC, no contractual or regulatory requirements exist that would require groundwater monitoring or dewatering. At that time the wells could be properly abandoned according to industry standards.

Basis of Estimate

Strategy for Accomplishing Function: 1) Subcontract to a geotechnical firm and supervise the activities using EPA guidance documents and industry standards

Applicable Requirements/Procedures: Project safety procedures

Input Descriptions:

- N/A

Output Descriptions:

- 120 RGAMMA and 120 RGROSS samples for RAL
- Grouted former boreholes with no potential vertical pathway for water migration
- Report of well abandonment

Assumptions:

- Well casings and screens can be pulled and effectively remove most of the well construction materials

Estimated Time to Plan the Work (Including Review and Approval): N/A

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 40 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 *Group 1 160*

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	32		
Project Manager/HP Manager	HBPM	32		
Task Leader	HBTL			
Battelle Technician	HBT	320 + 32		
Battelle Technician O/T	HBTO			
RAL Staff	HLB			
Support Professional	HBP	2+40+120+2		
Secretary/Clerical	HBS	2		
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Special Project	HCF	240		
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS	32		
Bartlett Health Physics	HRH	120		
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Well abandonment services \$62,181

Special Equipment/Material: N/A

Comments/Explanations: -----

Basis of Estimate:

What is the estimator's experience? 25 years experience supervising well abandonments

What experience is directly related to BCLDP? Support to project since 1988

Did we apply a complexity factor during our thought process? No

Completed by: Tom Naymik

Date: 6/8/2002

Rev. No.: 0

☐ JN-1 ☐ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☒ Release Site

Activity No.: IS004

Work Pkg. No.: 7I5-B02

Function Name: Prepare Filter Beds Area Characterization and Final Status Report

Component Name: Filter Beds

Function Description: Produce the Characterization & Final Status Report for the Filter Beds

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization and Final Status Surveys consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination";
Characterization & Final Status Survey Plan for the West Jefferson North Site March 2000; BCLDP Procedures
DD-CP-002, 004; DD-93-04; PR-AP-17.1; TD-AP-2.0.

Input Descriptions:

1. Completed Data Sheets form Characterization & Final Status Field Work

Output Descriptions:

1. Characterization & Final Status Report for the Filter Beds

Assumptions:

1. Data Reduction & Report Generation will take 20 working-d post field activities
2. Review & Comment Resolution will take 15 working-d in schedule
3. Report Schedule will take 40 working-d total.
4. Map production will take 10d of labor
5. 6 professionals will take 8 hrs each to review/comment/resolve comments
6. 5 d of technician time is necessary to resolve/incorporate comments
7. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
8. IVC/NRC approval necessary for Area Report
9. Only one Area Report will be produced.

Estimated Time to Plan the Work (Including Review and Approval): 0 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	NA
Technical Advisors	HBTA	NA
Project Manager/HP Manager	HBPM	NA
Task Leader	HBTL	NA
Secretary/Clerical	HBS	NA
Support Professional	HBP	NA
Bartlett Health Physics	HRH	NA

Estimated Time to Perform the Work: 40 working days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/40/200	NA	NA
Technical Advisors	HBTA	6/1/48	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL			
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics –Maps	HRH	1/10/80	NA	NA
Data		1/25/200	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: CAD Map Generation Services 80 Hrs @\$42.30/Hr = \$3,384

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 at West Jefferson

Was a complexity factor used?

No, work similar to KA

Completed by: J. F. Poliziani

Date: 5/30/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☒ Release Site

Activity No.: IS005

Work Pkg. No.: 7I5-B02

Function Name: Conduct Filter Beds Area IVC

Component Name: Filter Bed Area IVC

Function Description: Support & have an Independent Verification Contractor (IVC) perform verification surveys & sampling consistent with the requirements of NUREG 5849.

Basis of Estimate

Strategy for Accomplishing Function: Filter Bed Area (IVC) will be subjected to the release process defined in NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination" Part of the process is to perform an IVC type survey to ensure release criteria have been satisfied.

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization and Final Status Plan for West Jefferson North Site (DD-97-02), March 2000; HS-AP-5.0; HS-OP-001.

Input Descriptions:

1. Areas to be IVC surveyed are remediated & a BCLDP final status survey performed.
2. BCLDP Characterization & Final Status Report for the Filter Bed Area

Output Descriptions:

1. IVC Survey Plan
2. IVC survey results & soil samples
3. IVC Survey Report

Assumptions:

1. Onsite survey & sampling takes IVC 5 days (1 day travel)
2. One HBTA to assist full time
3. One Bartlett HP tech to assist full time
4. Geoprobe Crew to sample for 2 days
5. No significant decon needed
6. Crew of 3 techs for 1 d spot decon

Estimated Time to Plan the Work (Including Review and Approval): 30 d

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1/30/20
Technical Advisors	HBTA	NA
Project Manager/HP Manager	HBPM	NA
Task Leader	HBTL	NA
Secretary/Clerical	HBS	NA
Support Professional	HBP	NA
Bartlett Health Physics	HRH	NA

Estimated Time to Perform the Work: 65 Total Days ;5 d onsite/travel; 30d lab analysis; 30d report generation

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/5/16	NA	NA
Technical Advisors—Safety	HBTA	1/5/53	NA	NA
Technical Advisor ---Char		1/5/40	0	3
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/1/8	0	2
Battelle Technician (HP)	HBT	1/5/40	0	3
Battelle Technician O/T	HBTO			
RAL Staff	HL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	2/1/16	0	4
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH	3/2/48	0	12
Bartlett Health Physics (full)		1/5/40	0	10
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: IVC Services for \$40,000

Special Equipment/Material: None Identified

Comments/Explanations: Estimate to be verified w/IVC

Basis of Estimate

What is the estimator's experience?

15 years health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to King Avenue

Completed by: J.F. POLIZIANI

Date: 5/30/2001

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☒ Release Site

Activity No.: IS019

Work Pkg. No.: 7I5-B04

Function Name: Prepare General Inside Fence/Unaffected Areas Characterization and Final Status Report

Component Name: General Inside Fence/Unaffected Areas

Function Description: Produce the Characterization & Final Status Report for the Inside Fence General Areas

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization and Final Status Surveys consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination";
Characterization & Final Status Survey Plan for the West Jefferson North Site March 2000; BCLDP Procedures
DD-CP-002, 004; DD-93-04; PR-AP-17.1; TD-AP-2.0.

Input Descriptions:

1. Completed Data Sheets form Characterization & Final Status Field Work

Output Descriptions:

1. Characterization & Final Status Report for the Inside Fence General Area

Assumptions:

1. Data Reduction & Report Generation will take 20 working-d post field activities
2. Review & Comment Resolution will take 15 working-d in schedule
3. Report Schedule will take 40 working-d total.
4. Map production will take 10d of labor
5. 6 professionals will take 8 hrs each to review/comment/resolve comments
6. 5 d of technician time is necessary to resolve/incorporate comments
7. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
8. IVC/NRC approval necessary for Area Report
9. Only one Area Report will be produced.

Estimated Time to Plan the Work (Including Review and Approval): 0 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	NA
Technical Advisors	HBTA	NA
Project Manager/HP Manager	HBPM	NA
Task Leader	HBTL	NA
Secretary/Clerical	HBS	NA
Support Professional	HBP	NA
Bartlett Health Physics	HRH	NA

Estimated Time to Perform the Work: 40 working days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/40/200	NA	NA
Technical Advisors	HBTA	6/1/48	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL			
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics –Maps	HRH	1/10/80	NA	NA
Data		1/25/200	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: CAD Map Generation Services 80 Hrs @42.30/ Hr = \$3,384

Special Equipment/Material: None Identified

Comments/Explanations: None

What is the estimator's experience?

15 years health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jeffersonm

Was a complexity factor used?

No, work similar to KA

Completed by: J. F. Poliziani

Date: 5/30/01

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☒ Release Site

Activity No.: IS020

Work Pkg. No.: 7I5-B04

Function Name: Conduct General Inside Fence/Unaffected Areas IVC

Component Name: Inside Fence General Area IVC

Function Description: Support & have an Independent Verification Contractor (IVC) perform verification surveys & sampling consistent with the requirements of NUREG 5849.

Basis of Estimate

Strategy for Accomplishing Function: Inside Fence General Area (IVC) will be subjected to the release process defined in NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination" Part of the process is to perform an IVC type survey to ensure release criteria have been satisfied.

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization and Final Status Plan for West Jefferson North Site (DD-97-02), March 2000; HS-AP-5.0; HS-OP-001.

Input Descriptions:

1. Areas to be IVC surveyed are remediated & a BCLDP final status survey performed.
2. BCLDP Characterization & Final Status Report for Inside Fence General Area

Output Descriptions:

1. IVC Survey Plan
2. IVC survey results & soil samples
3. IVC Survey Report

Assumptions:

1. Onsite survey & sampling takes IVC 6 days (1 day travel)
2. One HBTA to assist full time
3. One Bartlett HP tech to assist full time
4. Geoprobe Crew to sample for 3 days
5. Additional Significant Remediation not needed.
6. Spot decon @ 3 techs for 1 day

Estimated Time to Plan the Work (Including Review and Approval): 30 d

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1/30/20
Technical Advisors	HBTA	NA
Project Manager/HP Manager	HBPM	NA
Task Leader	HBTL	NA
Secretary/Clerical	HBS	NA
Support Professional	HBP	NA
Bartlett Health Physics	HRH	NA

Estimated Time to Perform the Work: 66 Total Days ;6 d onsite/travel; 30d lab analysis; 30d report generation

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/6/16	NA	NA
Technical Advisors—Safety	HBTA	1/5/5	NA	NA
Technical Advisor ---Char		1/5/40	0	5
Project Manager/HP Manager	HBPM			
Task Leader-Decon	HBTL	1/1/8		2
Battelle Technician (HP)	HBT	1/5/40	0	5
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician-Decon	HRD	2/1/16	0	4
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH	3/3/64	0	18
Bartlett Health Physics (full)		1/5/40	0	10
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: IVC Services for \$50,000

Special Equipment/Material: None Identified

Comments/Explanations: Estimate to be verified w/IVC

Basis of Estimate

What is the estimator's experience?

15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?

10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?

No, work similar to KA

Completed by: J.F. POLIZIANI

Date: 5/30/2001

Rev. No.: 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☒ Release Site

Activity No.: IS021

Work Pkg. No.: 715-B05

Function Name: Prepare and Submit Certification Docket for the West Jefferson North Site

Component Name: West Jefferson North Site

Function Description: Prepare and submit to DOE a Certification Docket for the West Jefferson North site.

Basis of Estimate

Strategy for Accomplishing Function: A document will be prepared to certify that decontamination and decommissioning of the West Jefferson North site have been completed according to regulatory requirements. The document will include a description of the site and its buildings, the approaches used to perform the remediation activities, and a letter certifying that remedial activities have been completed according to regulatory requirements. Attached supporting documents will include characterization survey results where applicable, final survey results, and IVC reports.

Applicable Requirements/Procedures:

DOE Order 5820.2A; DD-93-04; PR-AP-17.1; TD-AP-2.0.

Input Descriptions:

1. Building/site characterization survey results
2. Building/site final status survey results
3. IVC reports for the various buildings and site areas.

Output Descriptions:

1. Certification docket for the West Jefferson North site with supporting attachments
2. Certification letter attesting that remedial activities have been completed in compliance with all applicable regulations.

Assumptions:

1. Characterization and final status survey results will be collected and compiled throughout the duration of the project as the various areas are cleaned up.
2. IVC reports may lag as much as six months behind completion of remedial activities depending on scheduling of visits to the site
3. Approximately 30 working days will be required for preparation, review, approval, and printing of the docket once all the supporting documents are available.

Estimated Time to Plan the Work (Including Review and Approval): N/A

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 30 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640

Group 1

160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA	1 / 2 / 6	N/A	
Manager/Senior Staff	HBB	1 / 10 / 40	N/A	
Technical Advisors	HBTA			
Project Manager/HP Manager	HBPM	3 / 30 / 360	N/A	
Task Leader	HBTL			
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS	1 / 20 / 80	N/A	
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	1 / 10 / 20	N/A	
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH			
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: N/A

Special Equipment/Material: N/A

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? Twenty years experience in planning and conduct of government and industrial R&D projects at Battelle

What experience is directly related to BCLDP? Eight years of direct BCLDP experience planning and managing Remedial Action activities including material & utility removal, decontamination, excavation and drain removal, and asbestos abatement

Did we apply a complexity factor during our thought process? No. Estimate based on previous experience with docket preparation and projected scope of the activity.

Completed by: D. A. Seifert

Date: 4/28/02

Rev. No.: 2